



***Betula papyrifera* - Paper Birch**

Gaspé Peninsula, Quebec

THE BETULACEAE – BIRCHES, ALDERS AND HAZELNUTS

By Susan McDougall

The Birches - *Betula*

Another weeping birch, I thought as I walked our urban neighborhood in northeast Seattle. Even in the winter, the leafless downturned branches and the white bark were a giveaway. I wondered how long it would be before this old tree would join others cut to pieces to be recycled in a chipper. Once more I tried to understand the reasoning behind the development of these weeping trees. I suppose that in summer they add an interesting geometry to a garden, and some of the smaller ones work well in an urban or suburban setting. For me, modified conifers seemed to work better, as with an Alaska Cedar cultivar -- the species often has drooping limbs. So at least it fits. And I suppose the same could be said for the weeping birches so popular in urban gardens. In nature, many birch trees appear a bit unkempt, and the name of one – *Betula pendula* – acknowledges the downturned form.

But I have never liked the weeping cultivated birches very much. People who grow them seem to regret the decision, or with the purchase of a house the inheritance of such a tree, as the trees tend to large size, are inclined to drop detritus everywhere, and generally lose the fresh appearance of a young tree. Nevertheless, it always saddens me to see another birch – even a weeping one -- subjected to the bite of an ax. It is rather like well-intentioned parents buying their child a horse and having no place to put it and little knowledge of how to care for a large animal. What do we do now besides get rid of it?

The ending of the life of a tree is commonplace within and outside a city, but there is a dignity to a birch that adds a poignancy to its demise. Trees of the Northern Hemisphere, birches grow in the most rugged



**Birch form lines and "eye" –
Betula papyifera (Paper Birch)
ARNOLD ARBORETUM – BOSTON, MA**

of climates, and although some wander south of the 45th parallel, the majority are at home in the boreal and temperal forests of the northern latitudes. These trees eke out a living in places that humans avoid in the coldest months, or if such harsh landscapes are home and the sunny south is not an option, have the sense to stay indoors when the sun sinks below the horizon for months. Immobilized, the birches seek no shelter but only bend and sway and wait for the brief warmth of summer to grow and reproduce.

In spite of my disdain for the weeping forms, at some point I became very fond of birch trees. We did not have any in our yard in Seattle when I was growing up and, although I visited Birch Bay near the Canadian border on occasion, I do not recall the birch trees there. Weeping birches were common enough in the neighborhood to be passed by rather than acknowledged, and I wouldn't have thought to observe the differences between a birch and willow catkin; I didn't even know the birches bore catkins.

So the interest was latent, until David and I undertook our arboretum tour in 2011. It was on this trip I had the opportunity to photograph several birch species and cultivars. For the camera, the peeling bark as much as the entire tree provided a good subject, but I think it was the introduction to birch “eyes” that really got me hooked. I can’t think of any other group of trees that marks their trunks with the “eye of Sauron,” or, even better, the combination of eye and slash below that resembles the formlines of coastal Northwest Native art.



***Betula pubescens* (Downy Birch)**
Another “eye”
ARNOLD ARBORETUM, BOSTON, MA

witnessing the successful germination of enough seeds to make identification easier, the little leaves withered within a couple of days, leaving us mystified as to what had gone wrong. Was it too wet? Too warm?

About this time a house and land became available in the sunny town of Sequim, where the rainfall is half that of Seattle and the sea and mountains beckon at one’s doorstep. A place for our trees and maybe enough room to start what we now call our “betuletum.” We had a potted Asian birch which we brought with us, and a few smaller birch trees as well.

A move, and several purchases later, and the Betuletum is expanding. The trees like the new home, growing well the first season, with

I took many photos of these mysterious eyes, which turned out to be features of several species, and when we returned to Seattle we decided to give birches a try. From seed, in our greenhouse.

Well, that was the first mistake. Birch seeds are, to say the least, tiny. When one of these flecks of dust does germinate, the leaves are also tiny, as likely to be mistaken for a bit of moss or lichen than the beginnings of a tree. When we finally succeeded (some time later) in



***Betula jacquemontii* (Himalayan Birch)**
The beginnings of peeling bark
SEQUIM, WA

one producing the little catkins characteristic of the tree.

Now in the winter when I look out the kitchen window at our little birch trees, I can picture the unfurling of the first leaves of spring. It won't be long now. The Olympic Peninsula is going to be a paradise for these rugged trees. As the sap begins to flow you can almost hear the anticipation.

THE BETULACEAE

The Birch Family includes about 130 species worldwide most of them native to the Northern Hemisphere, with a few as southerly as the Andes of South America. There are six genera in the family – the Birches (*Betula*), Alders (*Alnus*), Hazels (*Corylus*), Hornbeams (*Carpinus*), and Hophornbeams (*Ostrya*), and Hazel-Hornbeam (*Ostryopsis*). The family is believed to have evolved in central China around 70 million years ago in a climate much warmer than is typical of their habitats today. This region is currently home to all of the genera and many of the species. Only the *Ostryopsis*, considered the most recently evolved, is absent from North America. Woody shrubs or trees, there are approximately 33 species native to the continent.

The three most familiar genera – the *Alnus*, *Betula*, and *Corylus* – are sometimes referred to as the “ABCs” of the Birch Family. In the discussion below, I refer to the three with those initials.

The Birches – *Betula* – “B”

The unique bark of many Betula species undoubtedly contributes to their popularity as landscape trees



***Betula uber* (Virginia Roundleaf Birch)**

The rarest of the *Betula*

MORTON ARBORETUM, LYLE, IL

and selection of the trait has led to the development of many cultivars. Varying from chalk-white to a deep rich brown, it is thought that the paler bark helps to prevent sunburn in the long summer days of the northern latitudes. The bark of most peels, often in long strips, adding to the attractiveness of the stout, if sometimes curved, trunk. Birches are trees with many limbs and countless twigs. The leaves are typically toothed, deciduous, bright green in summer, and somewhat dull in autumn. As with other Birch Family genera, the birches bear unisexual flowers, which sometimes take on a catkin-like form but may also be very compact. The seeds are small. Birches like sun and so often grow in sites cleared of other trees. They are short-lived and in the absence of disturbance will succumb as the replacement conifers rapidly fill the gap.

Eating the birches

Birch species offer little nourishment to mammals. The twigs aren't digestible, the small flowers are arranged in a hanging "catkin," (technically called an ament), and the seeds are petite, with little wings. I haven't tried a seed, but I imagine the experience it is rather like a small bird with a little moth, the wings sticking out of the bill.

Luckily, there is a consumable that does not involve seeds at all, but rather comes from birch bark – beer. Unfermented or fermented, the use of the bark for a soda or alcoholic drink goes back centuries,



***Betula* seeds barely visible as little raised ovals with wings**

GRAND PORTAGE, MN

available. Add some sugar, carbonated water (or yeast for fermented beer), other ingredients if desired, and the end product is – birch beer!

There are older recipes that involve collecting twigs or bark rather than buying processed birch products.

Unfortunately, birch beer is neither nutritious nor non-fattening. It lacks any vitamins or minerals, is slightly less than regular beer in calories, and high in carbohydrates. Like so many other tasty drinks, it isn't particularly good for you. Which I suppose is sufficient reason to try it.

Nutritional and medical benefits of *Betula*

As a tasty root beer-like drink, with the added interest of being a natural product, birch beer enjoys a popularity today that may surpass that of the past, when perhaps it was concocted more as a last resort

which brings up the question of who discovered it in the first place. Possibly it was the wintergreen scent and taste of the bark of some species. Various parts of the tree were utilized for medicine by indigenous peoples of the Northern Hemisphere, and probably the bark of other trees was taste for its sweetness.

Today, you don't have to collect bark or otherwise encounter a birch tree to make birch beer. Just visit a health food store and there it is, ground up for easy use. Or, if that is too grainy, birch oil is



***Betula papyrifera* (Paper Birch)**

Lichen-encrusted bark on an old tree

PICTURED ROCKS NATIONAL SEASHORE, MI

than a preferred drink. However, in recent years compounds within the bark has become an important subject of medical research as a possible anti-cancer drug. These are betulinic acid and betulin, both found in birch bark, but several other plant species as well, a presence that has resulted in several name changes; in particular, betulin was first known as “graciolon,” derived from a Plantain Family member. Now settled on betulin, a chemical that was discovered in the late eighteenth century, the simple molecule (as organic molecules go) is responsible for the white color of the bark. It is also present in the sap in smaller concentration, and may be easily converted to betulinic acid, which is more concentrated.

The possible use of betulinic acid as an anti-cancer agent was first discovered in 1995 when a researcher at the University of Illinois noted the reduction in melanoma cells when treated with the chemical. Concentrated on melanoma at first, research expanded to the possible treatment of other cancers, including colon, breast, bladder, pancreatic, and leukemia, to name a few. Betulinic acid follows different pathways in its effect on cancer cells, but it is clear that this natural product can fight cancer. Betulin has also been demonstrated to reduce cholesterol, lower lipid levels, and possibly aid in diabetes by increasing a sensitivity to insulin.

There are difficulties in creating effective drugs from these compounds, the most troublesome being that betulinic acid is not particularly water soluble, making absorption slower than other drugs. Betulinic acid is also a candidate for the treatment of chronic pain, and it is interesting note that the “Federal Pain Research Strategy,” created by the National Institutes of Health, has recommended the development of nonopioid analgesic sources for the relief of pain. Hence the interest in this naturally occurring substance present in birch bark.

Development of betulinic acid did reach the point of clinical trials, the last important step to making drugs based on this compound available to patients but was cancelled due to funding issues. The research is international in scope, and in at least one country, field studies of birch trees were conducted to determine the concentrations of betulin in different birch species across a variety of habitats.

Long before the discovery of betulin, birch sap was believed to be an excellent medicine for skin irritations, rheumatism, and for breaking up kidney stones. The leaves were prepared as a detoxifying tea, for the treatment of gout, and as a salve for the skin. Birch oil was also used for muscle aches and eczema, and birch sap and tea may have provided both an excellent drink and served as medicine.

Historically it was not the medical use of the bark but rather its disease-resistant qualities that traditionally made the presence of birch forests so desirable. The bark had a spiritual significance to Native Americans and stories of the tree honored its importance to several tribes. Birch trees were believed to be immune to lightning strike, and thanks were given to trees used for products that ranged from birchbark canoes to house coverings and smaller items as well - containers, dishes, sap-collecting bowls, and tinder for torchlights. The inner bark could be made into a flour and consumed when famine threatened.

Today, the traditional use of birch bark in canoe building continues and classes in construction are available to those with the patience to learn something of this ancient art. Instructions for building canoes are available online, but it is a multi-step process, and acquiring real expertise in the craft is not an overnight endeavor. Often the construction of a canoe reflects an interest in the cultures that

depended on it for survival. To those people the construction of a canoe embodied a mixture of art, spirituality, and practicality.

A single large tree is required to create a canoe, but the search for the perfect tree may take days, and once constructed, the vessel will serve its passengers for years, historically providing an irreplaceable means of surviving in the cold, sometimes unrelenting lands where the birch tree grows.

The Alders – *Alnus* – “A”

Not as pretty as the birches, the alders offer neither the bark for a canoe builder nor the sap for the brewer. Yet it is the lowly alder that enriches the soil with nitrogen, vital to all plants. And it is the alder that often grows where other trees cannot; from glacial outwashes to rock strewn hillsides, alders push their limbs skyward. Rewarded with the sunshine of open spaces, they grow rapidly, stopped only by a short lifespan, to be replaced by other species, until the ground is disturbed once again.

Red alder (*Alnus rubra*) is aptly named, for in the late winter entire forests of this western tree are transformed by the opening male catkins to a hazy, rosy hue. Gone is the stark gray of winter; soon to return are the masses of bright green summer leaves. From the lowlands to middle mountain elevations, alders are the most common of the



***Alnus rubra* (Red Alder)**
Gray bark with pale lichens
REDWOOD NATIONAL PARK, CA



Red Alder - male catkins
SUNSHINE POINT, MOUNT RAINIER
NATIONAL PARK

Pacific Northwest leafy tree species. Potentially

nearly a hundred feet tall, Red Alder ranks as the largest alder north of Mexico. Often with multiple trunks, it is a pioneer species, locally abundant, but with a native range limited to the west coast and central Idaho. In winter, the contrast of the pale gray of Red Alder branches with the dark conifers such as Douglas-fir offers a cheerful uplift to an otherwise gray day. When spring comes, the forest darkens as the toothed leaves open, blanketing the limbs and branches of this robust tree.

Red Alder is primarily a lowland species, but the closely related Sitka Alder (*Alnus viridis* ssp. *sinuata*) grows at much higher elevations where it typically takes on a



***Alnus viridis ssp. sinuata* (Sitka Alder)**
MOUNT RAINIER NATIONAL PARK

shrubby form, although it can reach tree height. The bane of hikers who would dare to try to traverse a Sitka Alder thicket, pausing to look at the obstructive shrub will reveal to the fatigued the bright green double-toothed leaves and long catkins. Hardy in its mountainous habitat, Sitka Alder grows at lower elevations as far north as the Arctic Ocean, and west to the Aleutian Islands.

There are eight alder species in North America, the majority of them adapted to cool climates, although most do not typically range as far north as the birches. A couple of species are native to the southwest, including one (*Alnus oblongifolia*) that grows only in New Mexico and Arizona.

Able to thrive in a much cooler climate,

Thinleaf Alder (*Alnus incana ssp. tenuifolia*) grows north of the Arctic Circle and throughout southern and central Alaska; amazingly, this tree is also present in the Southwest. It overlaps with the other subspecies of the same species (*ssp. rugosa*) in the Rockies. This tree is the most common alder of the Canadian Shield, reaching as far north as Hudson’s Bay. Surely, the alders are amongst the most cold-adapted of trees.

Worldwide, there are about 35 species of alder, nearly all of them native to the Northern Hemisphere.

Eating the Alders

Unlike the closely related birch, which at the very least may be ground or tapped for a smoky drink, as a source of nutrition alder seems to be more in the “survival” category. It is said that the raw catkins are edible, although somewhat astringent, and the pollen borne on the catkins is a source of protein. Some bold experimenters have boiled the catkins several times and then ground them into a flour. According to one source, when mixed with rye flour in equal proportions and made into a biscuit the result was somewhat gritty, with a bland taste. One recommendation is to add alder catkins to boiled worms for a tasty treat!

It seems unlikely that alder catkins will be giving their all for human use in the future. As with so many trees alder has little to offer in the way of sustenance.

Native Americans were probably more likely to smoke the bark of alder trees than eat any tree parts. The bark was used as a kind of tobacco (named “kinnikinnick”).



Alnus incana ssp. tenuifolia
(Thinleaf Alder) female “cones”
BEAR GAP, WASHINGTON

Medical benefits of Alder

However, the medicinal applications of alder are quite another matter. Historically, various species have been utilized by people worldwide for a wide range of health concerns. Cancer, bruises, diarrhea, malaria, sores and other skin disorders, syphilis – the list goes on. The inner bark of at least one species is processed into a wash to treat lice and skin problems. Another is traditionally used for dysentery, stomach pains, and diarrhea. Even alcoholism has been treated with *Alnus*.

With such widespread use it is not surprising that the *Alnus* genus has been scrutinized by modern studies to ascertain the validity of many of these uses. In particular, studies in pharmacognosy, a branch of pharmacology with emphasis on medicinal properties of plants, have examined in detail the chemical constituents of alder. One review of several professional papers reveals how seriously the subject of medicinal applications of *Alnus* species is taken. The subject of some of these articles concerns folk use; others take a more scientific approach, examining flowers, wood, bark, and other parts of Alder trees. Chemical studies reveal many types of what are known as “secondary metabolites,” and much is known about the organic chemistry of alder species. Reading the specifics of some of these studies is a venture into the unknown, a foreign language in which I cannot even say “hello” and expect an answer. There are various recognized tests with mysterious acronyms, 25-letter long words of various chemicals, types of cells unknown to those outside the research community. Bark of one species was tested against a specific influenza (at least a word I could understand!), with conclusions based on “activity” – that is, how did the specific compound fare against other known controls.

Although the language of technical studies is often baffling to the non-specialist, sorting through the literature does shed some light on the question of how effective compounds present in alder species are as compared to their reported traditional effectiveness. Are various parts, such as bark and leaves, effective against sores, cancer, stomach cramps?

The results of many studies indicate that the use of alder leaves or bark may indeed be effective in the treatment of various afflictions. One study of three species determined the benefit of leaves in treating open wounds. Research into *Alnus japonica*, an Asian species, indicated efficacy against tumors, while another of *Alnus incana*, the alder with the most northerly distribution in North America, demonstrated its antimicrobial properties.

The bark of some alder species contains betulin, the compound shown to be effective against a variety of cancers, including melanoma, as well as HIV. At least one, the Japanese Alder (*Alnus sieboldiana*) possesses a compound that may help the battle against lung cancer.

Perhaps the most comprehensive study of alders has reported that 273 chemical constituents are present in the genus, divided into five groups. The chemical structures of many of these compounds have been determined, as reported in one paper written by Chinese scientists. This breakdown of the active ingredients in alders is the result of the work of many researchers, particularly in Asia, and at least one of the five groups is considered particularly worth investigation for its anti-cancer potential.

The increased interest in naturally occurring chemicals, such as those in *Alnus*, provides an impetus for looking more closely at “fold remedies,” putting the rigor of science behind the traditional use. This examination of the potential of plants, including the alders, may provide new hope for sufferers of

devastating diseases such as the many forms of cancer, and confirm the importance of studying the effects of the identified constituents of tree parts.

Decoration and Cooking

Although alder trees do not offer much nutrition, the bark of some species was traditionally important for its use as a dye for cloth. The dye is extracted from the inside of the bark which is also rich in tannins. Obtaining a preferred color, such as orange or red, is not a trivial matter, and, not surprisingly, websites with descriptions of processes and pitfalls are readily available. As with many naturally-occurring products, the interest in alder bark as a source for dye has increased over the years, and undoubtedly the availability of the Internet promotes the exchange of information and new experimentation. Much can be learned if the interest is there.



***Alnus rhombifolia* (White Alder)**

An alder that grows in dry habitats

LAKE FULMOR, CA

Alder bark might be excellent for a warm-colored natural dye, but over the centuries it was the wood beneath the bark that proved so useful to humans who lived within reach of an alder forest. For if you couldn't derive nutrition from wood, you could at least cook with it, and, in the Pacific Northwest, alder was used to prepare salmon with a smoky, succulent taste that no other method could match. If you aren't fortunate enough to enjoy a fresh smoked salmon, cooked over alder coals, there is always the canned or packaged method. Numerous recipes provide the novice with expert advice, and to cook salmon in this time-honored method, you need only visit the local lumber yard and purchase an alder plank or two!

Traditionally, however, Native Americans had neither planks nor saws to cut them, but the practice of smoking salmon was of great cultural and spiritual significance to many tribes. Unlike a restaurant of today in which smoked salmon can be available in minutes, for some tribes the traditional

smoking of salmon could take 2-3 days, or sometimes longer. Smoked salmon was of importance for winter sustenance, and the availability of fish a measure of the welfare of the tribe. Native American stories whose subjects include both the salmon and the alder tree teach about the dependency upon and the importance of the natural world. Although lacking in the beauty of the more northerly birches, the alder received an appreciation borne of knowledge, use, and need.

The Hazelnuts -- *Corylus* - “C”

Nestled amongst the invasive Himalayan Blackberries in an old suburb of a Northwest city, an exotic Hazelnut, perhaps germinated from a nut dropped by a child, reveals its presence with a bountiful crop of inch-wide nuts. Not far distant its native relative grows in an area opened by a windstorm that dropped a dozen tall trees.

Two *Corylus* species are native to North America, one (*Corylus cornuta*) with two subspecies, making it the most widely spread Hazelnut. A third species, *Corylus avellana* (European Hazelnut), native to Europe as the common name implies, is widely grown, particularly in Oregon. Only one, the Beaked Hazelnut (*C. cornuta*) achieves tree size and is distributed across the continent, although it grows north only as far as southern British Columbia. As with other members of the Betulaceae, these are temperate species; there are 15 species worldwide, native to North America, Europe, and Asia. Hazelnuts are typically found in somewhat dry woodlands or forest edges, occasionally in wetlands, from coastal sites to mountain habitats. Also known as Filberts, *Corylus* has been cultivated for the tasty, nutritious nuts for thousands of years. Today, in addition to the importance of growing hazelnuts for the local economy of several countries, the nuts and other parts of the tree have received increased attention from the scientific community.

Eating the Hazlenuts

At last! Here is a member of the Birch Family that you can eat without grinding or boiling, mixing or shredding (and wrinkling your nose at the taste). This is the “C” of the “ABCs” of the family – the genus *Corylus*, or Hazelnuts. Often more of a shrub than a tree, some species reach a height of 50 feet with a single trunk.

Whether shrub or tree, the most obvious feature distinguishing the Hazelnuts are the clusters of round nuts. The leaves are typically rounded, and the shape of the shrub or tree is broad. Unlike other Birch



***Corylus cornuta* ssp. *californica* (California Hazelnut)**

YOSEMITE NATIONAL PARK, CA

Family members, Hazelnuts occasionally have tiny sepals on the male flower, and the female catkins are small. Non-native trees pop up here and there in the Pacific Northwest, often alongside city streets. But there are natives as well, which thrive from the lowlands to the low mountain habitats.

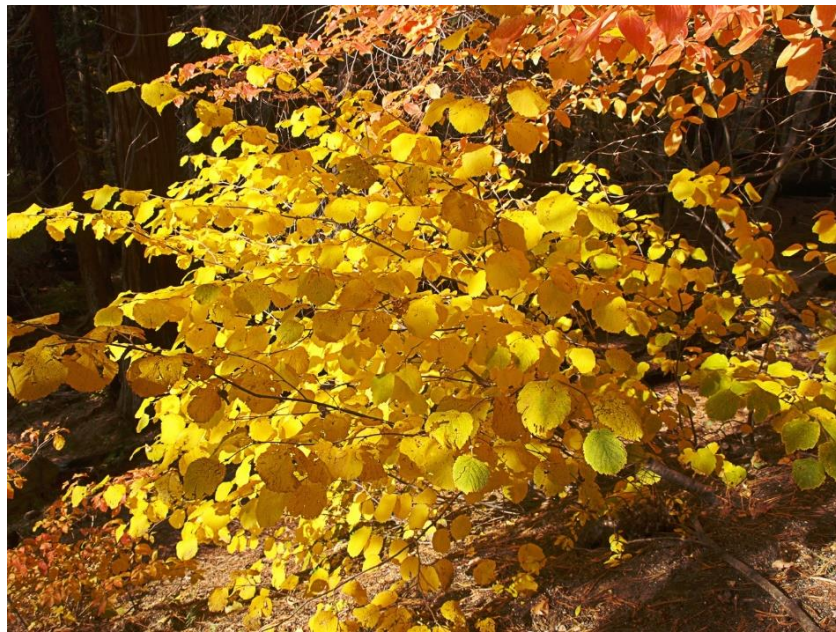
Some species are clothed in a peeling bark, similar to the birches, such as this Farges Hazelnut (*Corylus fargesii*) – named for an early 20th century French plant collector - which seems to glow in the late afternoon sun.

Turkey is the leader in hazelnut production, exporting nearly 82 percent of the world's supply; on the average 400,00 tons or more are produced yearly. The United States also exports hazelnuts, but the country is not the leading consumption per capita – that distinction goes to Italy; Greece and Turkey are next.

In Turkey, hazelnuts can be grown where other trees struggle, including steep slopes where the trees help to prevent soil erosion, and on impoverished soils. The nuts are processed with various methods, including the production of a paste, and hazelnut production employs a significant number of Turkish citizens.



Farges Hazelnut – *Corylus fargesii*
MORRIS ARBORETUM, PA



Autumn color - California Hazelnut
YOSEMITE NATIONAL PARK, CALIFORNIA

Oregon produces the most hazelnuts in the United States; if you drive Highway 5 south of Portland through the Willamette Valley you will pass acres of the small trees. This hazelnut is not the Northwest native but rather is the European Hazelnut (*Corylus avellana*) which was introduced to the region in 1847, by any account early in the European history of the state. But the history of human use precedes this introduction by nearly 10,000 years; charred shells have been found in European Stone Age sites, and

the Chinese culture considered it a sacred food nearly 5,000 years ago. In North America, hazelnuts were eaten by many Native American groups, both raw and roasted. The nuts were also used for their oil, and a dye was extracted from the roots. In a similar manner to the maintenance of huckleberries and other plants, fields of hazelnut shrubs were occasionally burned: new shrubs would sprout from the blackened crowns.

In part thanks to the Internet, hazelnut recipes are available by the hundreds on various sites; the nuts are particularly popular in desserts which may be as simple as a biscuit or as complicated as a multiple-layered cake. They are used to top salads, for candy, in a pear pizza (!), in stuffing, gelato, and ice cream. Hazelnut beer enjoys some popularity and is produced by a few major breweries. Sometimes it is mixed with chocolate in a porter-style beer, and, if you want to make your own, recipes are available.

Nutritional and medical benefits

As with the investigation of birch bark and other parts of *Betula* species, modern studies of hazelnuts have focused on both their traditional and the specific chemical constituents of both the nuts and other parts of the tree. Many of these studies have consisted of adding the European hazelnut in varying quantity to the diet of control groups and measuring the possible effects on blood chemistry. Summaries of these studies have also been conducted, applying rigorous analysis of the methodology. Most indicate that the addition of hazelnuts has the positive outcome of increasing “good” cholesterol (HDL) and thus helping in the prevention of cardiovascular heart disease. Nutritionally, hazelnuts are low in saturated fats, high in carbohydrates, and vitamin-rich.

In at least one study, carried out by researchers at Oregon State University, older adults showed increase in vitamin E and magnesium, nutrients apparently somewhat difficult to obtain, when hazelnuts were included in their diet.

Hazelnuts have also been shown to be an effective tool against certain types of cancer, particularly cervical, liver, and colon cancer. The skins of hazelnuts are known to be an excellent source of antioxidants.

One of the most interesting results of investigation into the efficacy of Hazelnut species against various human afflictions is the discovery that many species are sources of taxol, a chemical known to be effective against breast cancer. Previously believed to be present only in coniferous species, such as the Pacific Yew (*Taxus brevifolia*), and known technically as paclitaxel, the chemical is present in the hazelnut shell and can be extracted. Thus, discards of the shelling of nuts could provide a source for this important cancer-fighting drug.

Hazelnuts are not unique in possessing chemical compounds (such as unsaturated fats) that demonstrate positive outcomes for human health. What is most interesting is the focus of many studies on plants that may prove beneficial. This is a worldwide phenomenon, sometimes, but not always, encouraged (and presumably funded) by the hazelnut industry, but performed with scientific rigor. A “handful of nuts” a day is apparently sound advice!

White Bark

Not far from our home, a row of birch trees grows in a parking strip at the local medical clinic. They are hard to miss; the bark is so white as to glow in the sun. As with Paper Birch, the bark is peeling away, exposing a somewhat pinker color beneath, but the impression is of a nearly unnatural white. These trees are undoubtedly a cultivar, perhaps of Paper Birch. They are at the limit of whiteness, more than any manufactured product than I can imagine. Even the camera cannot capture what the eye sees.

A mile away, a grove of a species rarely planted, the Red Alder, thrives on land vacant of other use. Useful to humans for a crackling fire, or perhaps a table or bookshelf, the alder won't be found at most plant nurseries; as amongst the most common of Northwest trees, they are not known as an attractive addition to the garden. Yet surrounding the lichen-encrusted bark of a curved trunk, the winter twigs glow pink in the low southern sun. The new year's hope for the alder, the colorful male catkins need only a few days of warmth to open and release their contents. Meanwhile, root nodules below the ground absorb nitrogen, enriching the soil with a contribution unmatched by many trees.

If left undisturbed, in a few years the alders will succumb, dying on land now ready for the long-lived, deeply green conifers.

Above the lowlands on an undulating terrain laid bare by receding glaciers, rocks and rubble exclude the green of tall trees; even the sun-loving Douglas-fir cannot grow in this sterile land. Difficult to navigate for the human visitor, this is a place for the occasional marmot or perhaps a mountain goat passing through to an inviting meadow. It is an otherworldly scene. Or so it seems from a viewpoint above where small flowers brighten the rocky surface and tiny willows grow.

But it is not a landscape from another planet, and a closer look reveals patches of green leaves borne on twisted, reaching branches, sprouting impossibly from the glacial debris. The Sitka Alder, reduced in stature from tree to shrub, grows here in isolation, far from the competition of its lowland cousin or any other plant. As with the Red Alder, it enriches the stripped terrain with life-giving nitrogen, and in time robust thickets will blanket and break the rocks, while grasses and herbs take root in young soils. Now the stout low conifers, their seeds borne to this high place by wind and animal, begin to push alder branches aside, and the beginnings of a rugged mixed forest that will nearly obscure its rocky origins, marks the passage of time.



A birch cultivar with chalky-white bark.

SEQUIM, WASHINGTON

