

CHINQUAPIN

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What's your water footprint?

Perhaps it's because I live in the suburbs of Atlanta where we are enduring an 'exceptional' drought and have been under a total outdoor watering ban for nearly a year that this article from the June 22 *Arizona Daily Star* By Sarah Garrecht Gassen caught my eye. It seems to apply in the Southeast as well as Arizona. I've been collecting sink and shower water for other use for a year.

Water conservation can begin with your dinner plate. Sure, it looks like merely a hamburger with cheese, a baked potato and a cup of coffee. But look at it in terms of water: It took about 464 gallons of water to produce that quarter pound of beef, 108 gallons to produce a potato, 37 gallons to make 1 ounce of cheese and 37 gallons of water to create your 8-ounce cup of coffee.

"This concept of calculating how much water goes into the production of food or other items is called 'virtual water.' Instead of seeing only the item in front of you—say, a ribeye steak—you look at where it came from, how the cattle was raised, how many gallons of water were used in irrigation to produce the feed the cattle ate, how many gallons of water were used to create the fertilizer and pesticides used in raising the feed corn, how much water was consumed by the actual animal, how many resources went into getting that animal from the ranch to the slaughter house to the packing plant to the store to you.

"Giant water problems involve regions, municipalities, states and tribal governments and are so involved and technical that they're too huge for many people to tackle.

"So we come back to the dinner plate.

"Agriculture is by far the largest user of water in Arizona, and for the world, said University of Arizona Professor George Frisvold, who studies resource economics. He has been talking with agricultural producers about water policy for a research project.

"People will say agriculture uses all this water, but they'll say we're not having swimming pools and using it up, we're putting it into food that people are using,' Frisvold said. 'A frustration for them is people don't think, 'I'm sitting down and having my dinner and I'm having my salad' — they're not thinking and not realizing how much water went into the lettuce you're consuming.'

"Water policy—even the words sound wonky—comes down to this: How much do we have, who gets to say how it's used, and when push comes to shove who benefits and who loses? The tendency is to think about water in regional terms or as a hyper-local issue, about what we can do to save water. Using low-flow toilets and desert landscaping are valuable things to do and they help conserve water. But the calculus of

water is much more complex.

"Today, food ties the world together. We make choices every day—hamburger or veggie burger, a baked potato or rice, an apple or banana, a glass of beer or wine—that have consequences across the globe. Wasting food, or even not finishing the whole pot of coffee, becomes a much bigger deal once we realize how much water goes into the things we consume.

"And virtual water should play an important role in deciding what industries a community wants to attract and support. The City of Peoria in Maricopa County has developed a policy that requires the city to calculate the economic value, per gallon, of water when changes to land use are proposed.

"They're saying, what if we have houses going on land versus some industry going on the land?' said Sharon Megdal, director of the Water Resources Research Center at the University of Arizona. 'It's not the factor considered, but what does it mean for tax revenue, jobs—not just look at this as the water used on the land, but the whole picture associated with water use.'

"Seeing water in every action and in every product takes a change in thinking. But once the connection is made, it's hard to ignore, especially as food shortages around the world prompt riots and hunger. Eating lower on the food chain—specifically, eating less meat—makes the biggest difference.

"I think people at the global level are talking about this with global trading in food, but it's only now becoming a local issue,' said Pat Gober, the co-director of the Decision Center for a Desert City at Arizona State University. 'If somebody in Phoenix consumes a hamburger it's not consuming much of Phoenix's water, but it's consuming Brazil's water, or wherever the beef was raised. It's the globalization of our food supply.

"Food as a way of conserving water,' said Gober. 'I think it's an important thing to think about.'"

Castanea Available Online for SABS Members

SABS members may obtain recent *Castanea* articles, Volumes 69-73 (2004-2008) at BioOne. Viewing and downloading *Castanea* articles is free for SABS members with use of the proper username and password when accessed through the SABS website <http://www.sabs.appstate.edu>. The username is sabs and the password is castanea, all in lowercase. Thanks to our webmaster Charles Horn for making this arrangement with BioOne.

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The President's Perspective

by Conley K. McMullen

Greetings to all current members of SABS (old and new), as well as to all potential members who may be reading *Chinquapin* for the first time! Our newsletter editor, Scott Ranger, recently asked that I provide some "presidential" comments for the summer issue. He didn't specify whether they should be few or many, so I'll try to err on the side of few, as you'll no doubt want to direct most of your attention to the many interesting, informative, and entertaining articles that follow!

This is my first opportunity to address the entire membership of SABS, and I'd like to share a few things that I've learned about our Society since taking over as President at the end of April. First and foremost, my suspicions have been confirmed that an organization such as this doesn't run itself! Indeed, I've spent more time on SABS activities over the past two months than I did during an entire year as President-Elect. Rarely a day passes without some piece of Society business crossing my desk. As a result, I have a new respect for our Past Presidents, the most recent being Howie Neufeld. Fortunately, the President isn't required to do it all alone. By my count, we currently have approximately 40 individuals directly involved in the operations of SABS, including officers, editors, council members, committee members, and official representatives to other organizations. And, this number doesn't include our many members who review manuscripts for our official journal, *Castanea*! Equally important are those members who have not yet performed any of the above-mentioned roles, but who will do so in the future. Without a doubt, the best thing that you can do for SABS is to volunteer to become an active member. I would ask each one of you reading these words to send me an e-mail expressing your willingness to serve in one of the above capacities. As you can imagine, having a list of individuals eager to serve makes my job not only easier, but more enjoyable. So, please don't hesitate, let me hear from you today.

I've also learned just how much time and effort goes into producing a quality journal such as *Castanea*. Although all manuscripts

are now submitted electronically through Allen Track, we still have an Editor-in-Chief, a Managing Editor, and eight subject matter editors who keep the ball(s) rolling. Among other things, the subject editors are responsible for selecting reviewers for our manuscripts. And speaking of manuscripts, it now appears that the number submitted to *Castanea* by the end of the year will exceed that predicted by Howie Neufeld in our last newsletter! This is exciting news, and the direction toward which we have been working so diligently. We have Howie especially to thank for this. But, once again, it does mean that we will continue to recruit new editors. Please consider volunteering your talents in this area as well, and give our Editor-in-Chief, George Johnson a call.

Since these comments are being presented in *Chinquapin*, I feel that I must make a few special statements regarding our wonderful newsletter. I recently noticed on our SABS website that *Chinquapin* is defined as a Native American name for a smaller member of the genus *Castanea*. Well, that may be, but in our Society the newsletter plays a huge role in our mission, which is to promote botanical interest and to disseminate information concerning the flora and ecology of the southern Appalachian region and the entire eastern United States. For almost 16 years, *Chinquapin* has accomplished its mission by providing professional scientist and amateur alike with the best in botanical news. Scott Ranger, who became our Newsletter Editor this year, is continuing this legacy of quality newsletter items as can be seen throughout this issue. However, an organization's newsletter is only as good as the material submitted by its regular contributors and its readers. For this reason, I encourage all of you to consider contributing information and story ideas under any of the major headings that follow. And, I'm sure that Scott doesn't mind my saying that any suggestions for other topics are welcome as well. Remember, this is your Society; so please get involved! And, perhaps just as important to the success of SABS, encourage your colleagues and friends to join our Society and spread the word. Have a great summer!

Botanical Excursions

by George Ellison

Bradford Torrey's *A World of Green Hills* was published in 1898 by Houghton Mifflin and Co. The book is divided into two parts, equally devoted to Torrey's travels in Western North Carolina and southwestern Virginia (Pulaski and Natural Bridge). The North Carolina portion was set primarily on the Highlands Plateau, which he accessed from Walhalla in upcountry South Carolina via a horse- and mule-drawn wagon.

Torrey (1843-1912) was born in Weymouth, Massachusetts. From the late 1880s until his death in Santa Barbara, California, he traveled widely in the United States to North Carolina, Virginia, New Hampshire, Tennessee, Florida, Arizona, and California. These journeys and his observations regarding natural history were initially recreated in articles written for *Atlantic Monthly* and other publications. After revision, the materials re-appeared in the thirteen books of nature writing published during his lifetime.

In an insightful overview of Torrey's life and work published in *North American Nature Writers: A Biographical Encyclopedia* (Greenwood Press, 2008), Kevin E. O'Donnell notes that as, "A close observer of nature, and a master of the 'ramble' when that literary form was at the height of its popularity, Torrey blended the 'nature ramble' with travel writing and ornithology, to introduce readers to emerging vacation destinations in the United States...just as vacation travel was becoming more affordable for Middle-class Americans."

In a letter cited by O'Donnell, the great nineteenth century naturalist John Burroughs described Torrey—a lifelong bachelor—as, "a fine-souled fellow [who] suggests a bird with his bright eyes and shy ways and sensitiveness."

As a nature writer, Torrey is primarily remembered as an observer of North American birds. While recently rereading *A World of Green Hills* I was, however, struck with how closely Torrey observed the plant life in and around Highlands. And I was amused at how surprised he was by the level of botanical knowledge the residents of the area displayed, even exclaiming at one point that "botany and Latin names might almost be said to be in the air at Highlands." In my experience and that of numerous other modern day naturalists and botanists, this keen interest in plants still prevails on the Highlands Plateau more than a century later. I have added a few notes in square brackets to supplement Torrey's narrative.

The human interview to which I look back with most pleasure was with a pair of elderly people who appeared one morning in an open buggy. They were driving from the town, seated side by side in the shadow of a big umbrella, and as they overtook me, on the bridge, the man said "Good-morning," of course, and then, to my surprise, pulled up his horse and inquired particularly after my health . . . Then, after a word or two about the beauty of the morning, and while I was still trying to guess who the couple could be, the man gathered up the reins with the remark, "I'm going after some *Ilex monticola* for Charley." "Yes, I know where it is," he added, in response to a question. Then I knew him. I had been at his house a few evenings before to see his son,

who had come home from Biltmore to collect certain rare local plants—the mountain holly being one of them—for the Vanderbilt herbarium [then part of the Biltmore House estate in Asheville]. The mystery was cleared, but it may be imagined how taken aback I was when this venerable rustic stranger threw a Latin name at me.

In truth, however, botany and Latin names might almost be said to be in the air at Highlands. A villager met me in the street, one day, and almost before I knew it, we were discussing the specific identity of the small yellow lady's-slippers—whether there were two species, or, as my new acquaintance believed, only one, in the woods round about.

At another time, having called at a very pretty unpainted cottage—all the prettier for the natural color of the weathered shingles—I remarked to the lady of the house upon the beauty of *Azalea vaseyi*, which I had noticed in several dooryards, and which was said to have been transplanted from the woods. I did not understand why it was, I told her, but I couldn't find it described in my Chapman's Flora. [A.W. Chapman's *Flora of the Southern United States* was published in 1860 and is now freely available in PDF format at books.google.com. *Azalea vaseyi*, pink shell azalea, now classified as *Rhododendron vaseyi*, is a Blue Ridge endemic found in a few counties in western North Carolina.]

"Oh, it is there, I am sure it is," she answered; and going into the next room she brought out a copy of the manual, turned to the page, and showed me the name. It was in the supplement where in my haste I had overlooked it. I wondered how often, in a New England country village, a stranger could happen into a house, painted or unpainted, and by any chance find the mistress of it prepared to set him right on a question of local botany.

On a later occasion—for thus encouraged I called more than once afterward at the same house—the lady handed me an orchid. I might be interested in it; it was not very common, she believed. I looked at it, thinking at first that I had never seen it before. Then I seemed to remember something. "Is it *Pogonia verticillata*?" I asked.

She smiled, and said it was; and when I told her that to the best of my recollection I had never seen more than one specimen before, and that upwards of twenty years ago (a specimen from Blue Hill, Massachusetts), she insisted upon believing that I must have an extraordinary botanical memory, though of course she did not put the compliment thus baldly, but dressed it in some graceful, unanswerable, feminine phrase which I, for all my imaginary mnemonic powers, have long ago forgotten.

The same lady had the rare *Shortia galacifolia* growing—transplanted—in her grounds, and her husband volunteered to show me one of the few places in the neighborhood of Highlands (this, too, on his own land) where the true lily-of-the-valley—identical with the European plant of our gardens—grows wild. It was something I had greatly desired to see, and was now in bloom.

Still another man—but he was only a summer cottager—took me to look at a specimen of the Carolina hemlock (*Tsuga caroliniana*), a tree of the very

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Taxonomic Advisory!

by Alan Weakley

“Red-headed step-children” – part of the family or not?

Most southerners know the phrase “red-headed step-children” to refer to the odd, unusual, or disliked ones who are shunned from the family, or not fully or readily accepted as part of the group because they are “different.” [Note that no apologies for the potentially offensive use of this phrase will be needed, as the so-called “red-headed step-children” will fare rather well here, and be embraced by their families and even be invited to Christmas dinner!]

Many eastern North American plant genera have “red-headed step-children” or odd cousins, a species or two that are clearly “kin” but differ in some significant way, and whose acceptance (or not) as part of the genus is controversial. Phylogenetic systematics (molecular and otherwise) has renewed some of these debates, settled others (though there are still dissenters), and posed new issues about the inclusion of these odd cousins. Molecular systematics has highlighted this issue in particular, as a bright light is shown on the occasional discrepancy between groupings based on obvious morphological similarities and family tree relationships based either on molecular change or on a broader suite of morphological characters.

In this issue of *Taxonomic Advisory!*, I'd like to focus on a set of “odd cousins” for whom recent evidence argues inclusion in a larger genus. Some of these are issues that have been around for 250 years, while others are brand new.

Amphianthus and *Gratiola*

As an example of a new one, Dwayne Estes & Randy Small (2008) have recently taken a bead on and shot down one of our celebrated southeastern endemic genera, showing that *Amphianthus pusillus* is nothing but a peculiar and specialized *Gratiola*. They have welcomed “snorklewort” into *Gratiola* with open arms, giving it all the rights and privileges owed to a *Gratiola*, and rechristened it *Gratiola amphiantha*. Well! This suggestion is based foremost on the results of analysis of gene sequences, showing that by far the most probable evolutionary sequence has *Amphianthus* evolving out of the middle of *Gratiola*. Estes & Small also analyzed morphological characters that had been used to separate *Amphianthus* from *Gratiola* and found that they were all equivocal, that the distinctive features of *Amphianthus* were readily explained by strong selective pressures related to its unusual habitat, and that many of its morphological features (such as seed texturing) corroborated the molecular phylogenetic evidence not only in its placement in *Gratiola*, but also in its relationships within that genus.

It turns out that this is a surprisingly frequent situation, in which a species or small species group with some distinctive morphological condition is revealed to be “evolved out of the middle” of a larger genus; not merely “next to it” or “kin,” but closer to one portion of the

genus than to others. Put in fancier terminology, one could say that the species or small group is part of a non-basal clade within the genus.

Nemopanthus and *Ilex*

Debate has continued for decades about whether the rare Southern Appalachian shrub known as “hill holly” is an *Ilex* (*Ilex collina*) or a *Nemopanthus* (*Nemopanthus collinus*). *Nemopanthus* was long regarded as a monotypic genus of northeastern North America (ranging south to West Virginia), but some of the allegedly diagnostic characters for the genus were present as well in *Ilex collina*, which superficially resembled not *Nemopanthus mucronatus* but *Ilex montana* and *Ilex ambigua*. The issue has apparently been resolved with strong evidence that *Nemopanthus mucronatus* is evolutionarily deeply embedded within *Ilex* (Powell et al. 2000). Aquifoliaceae is now regarded as having only a single genus, with *Ilex mucronata* and *I. collina* accepted as members (despite their slightly scandalous stamens).



Duchesnea and *Potentilla*

Duchesnea is often mistaken for *Fragaria*, based on the general similarity of trifoliolate leaves and red, fleshy, accessory fruits. Eriksson et al. (1998) make a strong case for its true affinities being with *Potentilla*, and in fact show it as evolving from within *Potentilla*. The accessory fruit derived from fleshy expansion of the receptacle has apparently evolved several times in tribe Potentilleae. One can imagine that the change might be developmentally relatively simple, and the selection pressure for dispersal via animal consumption of the fruits high.

Belamcanda and *Iris*

The Blackberry Lily, *Belamcanda chinensis*, is a familiar, old-fashioned garden plant in eastern North America, and is fairly frequently naturalized. It is known for its orange spotted tepals, and for its equally showy blackberry-like fruit, the shiny black seeds revealed by the separating capsule valves. A recent phylogenetic analysis (Wilson 2004) shows it deeply embedded in *Iris*, sister to subgenus *Iris* (which forms a branch (clade) of the family tree separate from the other subgenera of *Iris*). Earlier studies (see Wilson 2004 for discussion) showed *Belamcanda* as closely related within *Iris* to *Iris dichotoma*, and noted the similar branched inflorescences and vegetative characters. It appears that *Belamcanda* evolved from an *Iris*-like ancestor, losing the distinctive flower characters and gaining the fleshy-coated seeds for animal dispersal. Goldblatt & Mabberley (2005) made the necessary combination to treat *Belamcanda* as an *Iris*: *Iris domestica*.

Actaea and *Cimicifuga*

Actaea and *Cimicifuga* present yet another example of the ‘Mysterious Case of the Anomalously Fleshy Fruit’. In eastern North America, there are two species of *Actaea* and three of *Cimicifuga*, some of which so closely resemble one another as to present annoying identification issues when not in flower or fruit. In fruit, however, the fleshy berry of *Actaea* and the dry follicle of *Cimicifuga* seem to provide a striking



difference, yet many authors of the past quarter millennium (beginning with Linnaeus) doubted the distinction of the genera, noting numerous other morphological similarities. A phylogenetic analysis by Compton et al. (1998) showed that *Cimicifuga racemosa* was closely related to the fleshy-fruited *Actaea* on both overall morphological grounds (notably the single carpel as opposed to multiple carpels) and based on DNA sequence similarities. They concluded that the separation of *Actaea* and *Cimicifuga* based “on fruit type rather than fruit number is simply an over-emphasis of a single character.” For nomenclatural reasons, the unification of the two genera results in the relatively larger genus *Cimicifuga* being subsumed into the smaller *Actaea*. Our species fall into three sections: section *Actaea* (*A. pachypoda*, *A. rubra*, and *A. racemosa*), section *Podocarpae* (*A. podocarpa*), and section *Oligocarpae* (*A. rubifolia*).

Dodecatheon and Primula

Dodecatheon has Solanoid flowers, featuring “pendant flowers with reflexed petals and large, conspicuous, connivent, poricidal anthers,” a syndrome which has been “independently derived in numerous buzz-pollinated genera” (Mast et al. 2004). A robust molecular phylogeny shows *Dodecatheon* as a monophyletic group derived from *Primula*, specifically from *Primula* subgenus *Auriculastrum*. Earlier authors had noted the very close resemblance of these groups, one author even noting that *Dodecatheon jefferyi* and *Primula parryi* are “virtually indistinguishable when the corollas and inserted anthers are removed” (see Mast et al. 2004 for details). This appears to be another case where a striking morphological change has occurred under strong selective pressure; the obvious difference in appearance in the flowers obscuring the underlying close relationship. Mast & Reveal (2007) make the new combinations to include the species of *Dodecatheon* in *Primula*.

Leiophyllum, Loiseleuria, and Kalmia

Kron & King (1996) and Kron et al. (2002) demonstrate the evolution of the southeastern United States endemic *Leiophyllum* and the circumboreal *Loiseleuria* as derived members of *Kalmia*. *Leiophyllum* in fact closely resembles the small southeastern and West Indian *Kalmia* species, with the exception of its separate (as opposed to fused) petals and its lack of the distinctive anther pouches that distinguish *Kalmia* (in the narrow sense). One can imagine these changes as potentially simple evolutionarily modifications related to selection for pollinators.

Hepatica and Anemone

Everyone knows *Hepatica*, and that it is not *Anemone*; the three-lobed evergreen leaves, the... well, what is there really to fundamentally distinguish it from the diversity of *Anemone*? Not much!

Hoot, Reznicek, & Palmer (1994) state what can serve as a summary to all of the cases discussed above: “The most important changes found ... are subsuming the genera *Hepatica*, *Knowltonia*, and *Pulsatilla* to positions within *Anemone*. Each of these had been differentiated

from *Anemone* by a few prominent characters, such as the involucre in close proximity to the flower and the stalked achenes of *Hepatica*, the plumose, elongated styles of *Pulsatilla*, and the berry-like fruits of *Knowltonia*. Each of these exceptional characters can be seen as important adaptations to environmental conditions, but not necessarily helpful in determining fundamental relationships. There are many other morphological character states that unite these genera with other members of the *Anemone* complex.” (Hoot, Reznicek, & Palmer 1994).

While the idea of welcoming these evolutionary wayward souls back into the family fold may seem initially shocking, these strongly supported hypotheses reveal new knowledge of the ways in which the plants in our flora have evolved and innovated. They certainly cause us to look at these plants in a new light (sand-myrtle a *Kalmia*!? Hmm, well, maybe that isn't so outlandish after all...). Besides, I always wanted to have a native *Primula* as part of the southeastern flora!

Outcome

- Actaea podocarpa* A.P. de Candolle
- Cimicifuga americana* Michaux
- Actaea racemosa* Linnaeus
- Cimicifuga racemosa* (Linnaeus) Nuttall
- Actaea rubifolia* (Kearney) Kartesz
- Cimicifuga rubifolia* Kearney
- Anemone acutiloba* (A.P. de Candolle) G. Lawson
- Hepatica acutiloba* A.P. de Candolle
- Anemone americana* (A.P. de Candolle) H. Hara
- Hepatica americana* (A.P. de Candolle) Ker-Gawler
- Gratiola amphibantha* D. Estes & R.L. Small
- Amphianthus pusillus* Torrey
- Ilex mucronata* (Linnaeus) M. Powell, V. Savolainen, & S. Andrews
- Nemopanthus mucronatus* (Linnaeus) Trelease
- Ilex collina* Alexander
- Nemopanthus collinus* (Alexander) R.C. Clark
- Iris domestica* (Linnaeus) Goldblatt & Mabberley
- Belamcanda chinensis* (Linnaeus) de Candolle
- Kalmia buxifolia* (P.J. Bergius) Gift, Kron, & Stevens
- Leiophyllum buxifolium* (P.J. Bergius) Elliott
- Kalmia procumbens* (Linnaeus) Gift, Kron, & Stevens
- Loiseleuria procumbens* (Linnaeus) Desvoux
- Potentilla indica* (Andrews) T. Wolf
- Duchesnea indica* (Andrews) Focke
- Primula meadia* (Linnaeus) A. R. Mast & Reveal
- Dodecatheon meadia* Linnaeus
- Primula frenchii* (Vasey) A.R. Mast & Reveal
- Dodecatheon frenchii* (Vasey) Rydberg

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- Eriksson, T., M.J. Donoghue, and M.S. Hibbs. 1998. Phylogenetic analysis of *Potentilla* using DNA sequences of nuclear ribosomal internal transcribed spacers (ITS), and implications for the classification of Rosoideae (Rosaceae). *Pl. Syst. Evol.* 211: 155-179.



Rare Plants

by Linda Chafin

Alders, with 25 - 35 species in the genus *Alnus*, occur on every continent except Australia, reaching as far north as Greenland and Siberia, dipping into Africa along the Mediterranean coast, and following high mountains from Mexico down into South America. Most alder species are widespread – several, such as European black alder (*A. glutinosa*) and gray alder (*A. incana*), are circumboreal. A few are narrowly distributed – the Italian alder (*A. cordata*) is endemic to southern Italy and Corsica. But First Prize for “Weirdest Distribution” goes to our North American species, *Alnus maritima*, whose various common names – seaside or Delmarva alder, Georgia alder, and Oklahoma alder – point to its far flung locations.

From the first discovery of its extremely disjunct distribution there has been speculation about the cause. Widespread distribution by animals? Deliberate transport by Native Americans, who used alders in a variety of ways? Post-glacial retreat and restriction?

Current evidence seems to support the last hypothesis. There are three subgenera in *Alnus*: *Clethropsis*, *Alnobetula*, and *Alnus*. *Clethropsis* includes three species, two that occur in Asia and one in North America, *Alnus maritima*. It is likely that the ancestors of *Alnus maritima* crossed the Bering Straits land bridge into North America sometime during the Pleistocene. Once in North America, its ancestors may have spread across the continent, flourishing in the cold and wet Pleistocene climate. Pollen studies have shown that *Alnus* species were the most abundant tree genus in North America in the first few thousand years after the last glaciation; in the hotter, drier climate that followed, *Alnus* species retreated to wetland habitats. For *Alnus maritima*, all that remains of the Pleistocene glory days are three widely disjunct populations, separated by up to a thousand miles from one another, on the Delmarva Peninsula of eastern Maryland and southern Delaware, in south-central Oklahoma, and in northwestern Georgia.

Evidence supporting this theory includes the fossil remains of an alder, discovered in the Pacific Northwest, that appears to be intermediate between a south Asian species and *Alnus maritima*. Also, long distance dispersal, whether by animals or humans, usually results in the disjunct populations being genetically and morphologically similar. In the case of *Alnus maritima*, plants from the three populations differ significantly with respect to leaf shape, infructescence size and shape, and growth form.

These differences suggest that, over several millennia of isolation from

one another, the three groups of plants have evolved away from their common ancestor under the pressure of different environments. On the Delmarva Peninsula, where the species was first discovered, *Alnus maritima* grows in acidic soils along streams that flow into the Atlantic Ocean and Delaware Bay. In Oklahoma, the plants occur in alkaline soils on stream banks of the upper Blue River and its tributaries. The lone population in northwest Georgia grows in acidic soils along a spring-run, in the partially wooded pond (Drummond Swamp) that it feeds, and in an adjacent pasture.

Alnus maritima is a tall shrub, 3.5 - 9.5 meters tall, superficially resembling the widespread North American alders such as tag alder (*A. serrulata*) and gray alder (*A. incana*). What sets it apart from other North American alders are several features related to its reproduction.

Alnus maritima, like the other members of its subgenus but unlike any other alder in North America, produces its seed-bearing infructescences (“cones”) singly in leaf axils; our other alders produce cones in clusters of 2-6 on short branchlets. *Alnus maritima* cones are big, up to 2.8 cm long x 2.2 cm wide, larger than the cones of other eastern North American alders. While other North American alders produce immature infructescences in the fall and then flower early the following spring, *Alnus maritima* begins to develop infructescences in the spring but does not actually flower until late summer or fall, a pattern found in alders only in the subgenus *Clethropsis*. For *A. maritima*, the late flowering and subsequent winter seed dispersal may reduce seed germination and contribute to its limited distribution.

In each of the four states where it occurs, *Alnus maritima* is tracked by Natural Heritage Programs. Subspecies *georgiensis* is ranked as critically imperiled; subspecies *oklahomensis* is ranked as imperiled; and in Delaware and Maryland, subspecies *maritima* is ranked as uncommon. It seems

to be one of those plants that is “rare but locally abundant” And who knows? There may well be other populations out there. Those of us who like to tramp around in wetlands should keep an eye out for a late-flowering, large-coned alder.

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Alnus maritima
ssp. *georgiensis*

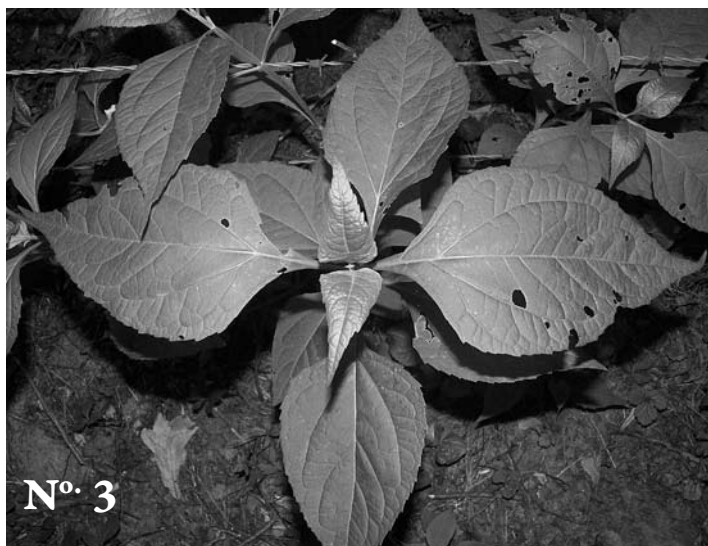
Mystery Plants

by Dan Pittillo

Since we didn't have room last issue for Dan's popular feature, this issue has two couplets for you to try. One couplet is pretty easy, the other more difficult. Good luck!



These ferns in early summer often look alike. N° 1 is a common fern throughout the East from New Brunswick south to northern Florida, eastern Texas and Wisconsin. N° 2 is confined to basic soils from Quebec to Louisiana and eastern Kansas.



In early summer two relatively common plants in the southern Appalachians are somewhat confusing if encountered in near proximity. N° 3 is seen from Pennsylvania and Ohio south to northern Florida. N° 4 extends further north to the Gaspé and west to Saskatchewan and down to northeastern Texas.

Good luck on this quiz. Please send your answers to Dan Pittillo, email preferred, dpittillo@gmail.com or mail it to 675 Cane Creek Road, Sylva, NC 28779

“Torrey” continued from page 3

existence of which I had before been ignorant. [Another Blue Ridge endemic that displays larger cones than the common eastern hemlock, *Tsuga canadensis*.] The truth is that the region is most exceptionally rich in its flora, and the people, to their honor be it recorded, are equally exceptional in that they appreciate the fact...

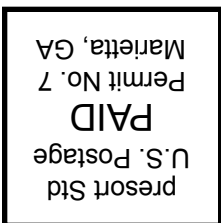
As universal time is reckoned—if it is reckoned—old Satulah [the mountain on which Highlands is located] and all that forest-covered world which I saw, or thought I saw, from it, were but of yesterday, a divine improvisation, and would be gone to-morrow... Better even than this wild Satulah garden was a smaller one nearer home: a triangular hillside, broad at the base and pointed at the top, as if it were one face of a pyramid; covered loosely with grand old trees—oaks, chestnuts, and maples; the ground densely matted with freshly grown ferns, largely the cinnamon *osmunda*, clusters of lively green and warm brown intermixed; and everywhere, under the trees and above the ferns, mountain laurel and flame-colored azalea—the laurel blooms pale pink, almost white, and the azalea clusters yellow of every conceivable degree of depth and brightness. A zigzag fence bounded the wood below, and the land rose at a steep angle, so that the whole was held aloft, as it were, for the beholder’s convenience. It was a wonder of beauty, with nothing in the least to mar its perfection—the fairest piece of earth my eye ever rested upon. The human owner of it, Mr. Selleck (why should I not please myself by naming him, a land-owner who knew the worth of his possession!), had asked me to go and see it; and for his sake and its own, as well as for my own sake and the reader’s, I wish I could show it as it was. It rises before me at this moment... and will do so, I hope, to my dying day.

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“Taxonomic Advisory!” continued from page 5

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Photographs by Scott Ranger



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