CHINQUAPIN

The Newsletter of the
Southern appalachian Botanical Society

Volume 21 (1)
Spring 2013

Bean Stranglers

By Lytton John Musselman, Old Dominion University

Felonies are seldom attributed to plants. But species of the genus *Orobanche*, known in English by the common name broomrapes, are notorious in the plant world for the damage—even death—they inflict on their victims. Vampire-like, they drain the vital fluids from their hapless hosts. The name of the genus literally means "bean strangler".

The family of broomrapes, the Orobanchaceae, is well represented in the flora of the Eastern United States. Most species belie their parasitic nature with a cloak of decency in the form of chlorophyll. A minority of the family lack chlorophyll including species of *Orobanche*.

Our native species of broomrapes are benign but one of the introduced species, *Orobanche ramosa*, is among the most serious parasitic weeds on the planet. In May 2006, a botany graduate student noticed the persistent capsules in the grass at a car wash in Norfolk and asked what the plant was! We returned the following May and found a few hundred flowering plants parasitizing *Medicago lupulina*. (Recently, there has been good evidence for putting *O. ramosa* in a segregate genus *Phelipanche*; the taxonomy of this complex needs additional study.) This is one of the worst members of a noxious group and is known in English as branched broomrape or hemp broomrape, the later in reference to a preferred host.

Orobanche ramosa*, Norfolk, Virginia in May 2007*. Corolla color varies from dark blue to yellow.

Being acquainted with the damage this weed can cause, I immediately contacted the US Department of Agriculture Plant Protection and Quarantine office. They came and duly eradicated the pest from the few square meters it occupied. But since then it has been found in other parts of Norfolk, thankfully never on a crop.

The list of crops it attacks is a long one. Hemp, *Cannabis sativa*, is no longer grown as a (legal) crop. But in the early 1900s the promising hemp industry in Kentucky was essentially wiped out by large infestations of this parasite. The hemp industry went but the parasite remained a problem on tobacco, another favored host. Other members of that family, Solanaceae, are also hosts including eggplant, tomato, and potato.

Parasitism of tomato by *O. ramosa* is widespread in the Middle East and around the Mediterranean as well as regions with a Mediterranean climate including California. Other crop hosts include various legumes (as with the Norfolk population), cauliflower, cabbage and many more including native plants and weeds. For example, on the campus of the American University of Beirut, *Oxalis pescaprae* (cape sorrel or Bermuda buttercup), an introduced weed, supports heavy parasitism of branched broomrape. It has the broadest host range of any of the broomrape species I have studied.

Fortunately, the only other pathogenic *Orobanche* brought into the United States is *Orobanche minor* known as common broomrape. It has been repeatedly introduced to this country for more than a hundred years. A survey of herbarium species of common broomrape shows that most infestations were in port cities. Perhaps the seeds were brought with ballast or packing material. It is readily distinguished from *O. ramosa* by its unbranched stems and cream colored corollas.

So it is no surprise that it has been found in Norfolk where it parasitized *Abelia* × *grandiflora* (glossy abelia, a common ornamental shrub). I have also seen the same broomrape parasitizing this host on the campus of Erskine College in South Carolina.

Orobanche ramosa *parasitizing tomatoes in Jordan. Tomatoes seem particularly susceptible to hemp broomrape.*

Like *O. ramosa*, the

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From The Editor's Desk:

Joe Pollard, Newsletter Editor

This issue sees a new name on the masthead as editor of Chinquapin. I've been working along with Dan for the past few months to ensure a smooth transition, but I thought I should take this opportunity to introduce myself to those who don't know me.

I grew up in Atlanta and began to appreciate the delights of the Southern Appalachians by hiking in north Georgia, and then began to study them as a botany major at Duke. I turned my back on the region for a while, as I pursued my doctorate at Cambridge University in England, and then my first faculty job at Oklahoma State University in Stillwater. But the pull to come back was strong, and in 1988 I joined the biology department at Furman University in Greenville, SC. For most of the last 25 years I've been a member and sometime officer of the Association of Southeastern Biologists, and a member of the Southern Appalachian Botanical Society (when I don't forget my dues – sorry Charles; I'll try to do better).

I teach classes in field botany and ecology, and I curate the herbarium at Furman. However, I wouldn't really call myself a systematist, floristic botanist, or community ecologist. My research interests are in physiological and evolutionary ecology, with a focus on how heavy metals affect plants and why metals accumulate in the leaves of some species to extraordinary concentrations. I spend a lot of time in the lab and the greenhouse, but I'm never really as happy as when I'm out teaching or doing research in the field, especially with a group of students. I'm studying field sites in the Carolinas, but

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Common broomrape parasitizing white clover in North Augusta, SC.

host range of common broomrape is extensive. Economically the most important hosts are clover, especially clover grown for seed, carrots, and very rarely tobacco.

Only witchweeds are more pernicious than broomrapes because witchweeds attack subsistence crops in some of the poorest regions in the world [see Chinquapin 20(4)]. Witchweeds are chiefly tropical in their distribution while broomrapes favor more temperate regions. Like witchweed, broomrapes must have a chemical stimulant from the host for the dust-like seeds to germinate and like witchweeds, broomrapes germinate and attach to their host roots underground, unseen and undetected unless host damage is evident. The seedlings are interesting because the roots that develop do not exhibit positive geotropism, that is, they will grow up or down. As soon as the plant emerges from the soil it begins flowering, the only reason it leaves its nether world is for seed production.

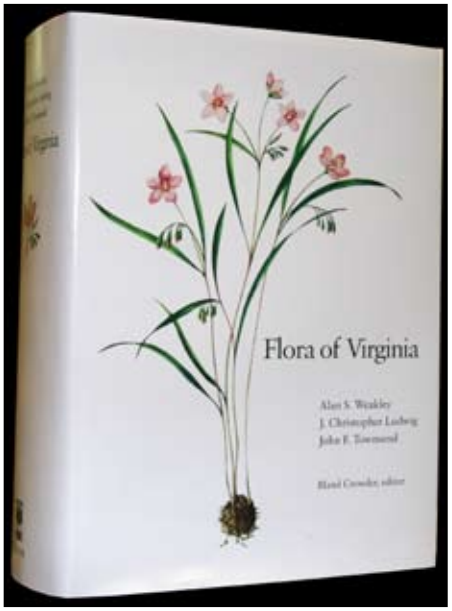
At present broomrapes are little more than curiosities in the southern United States. However, the recent discovery of *O. ramosa* in Norfolk is a warning that this serious parasitic weed may turn up in unexpected places.

Orobanche *seedlings. The youngest seedlings are on the left, the oldest is upper right and shows shoot development.*

An Introduction to the Flora of Virginia, a New Flora for the Old Dominion (and beyond)

By Alan S. Weakley, J. Christopher Ludwig, and John F. Townsend

We're glad to announce the recent publication of a new Flora of Virginia! The 1,554-page manual of the plants of the state was published in December 2012 by the Foundation of the Flora of Virginia (Richmond, VA) and the Botanical Research Institute of Texas Press (Fort Worth). It was produced by the Flora of Virginia Project, with important partnership support from the Virginia Department of Conservation and Recreation. The manual was written by Alan S. Weakley (Director of the UNC Herbarium, a division of the North Carolina Botanical Garden, and adjunct professor of biology at UNC–Chapel Hill), J. Christopher Ludwig (chief biologist with the Natural Heritage Program of the Virginia Department of Conservation Resources [DCR]), and John F. Townsend (staff botanist with the Natural Heritage Program of the Virginia DCR), and edited by Bland Crowder (also of Virginia DCR). It features 1,400 pen-and-ink plant illustrations commissioned for the book, by botanical artists Lara Gastinger, Michael Terry, and Roy Fuller. Barney Lipscomb and others at BRIT Press oversaw the printing and binding. Numerous other volunteers, staffers, and contractees, as well as over 675 donors, made this a large, team project.



This is Virginia's first flora since John Clayton's Flora Virginica was published in Holland in 1762! We've described the Flora of Virginia as a "traditional flora for the 21st century", and we'd like to provide an introduction to its traditional and novel features.

Format

The Flora contains the following sections: Introduction, Plant Discovery and Documentation in Virginia: A Historical Perspective (18 pp., by Nancy Ross Hugo and Donna M.E. Ware), The Nature of the Virginia Flora (52 pp., by Gary P. Fleming), Learning the Virginia Flora: 50 Sites for Productive Field Botany (9 pp., by Gary P. Fleming), the Key to Families (50 pp.), the Taxonomic Treatments (1225 pp.), Taxa Not Treated in This Manual (11 pp.), Glossary (28 pp.), Abbreviations (1 p.), References (65 pp.), and Index of Plant Names (87 pp.).

Taxa treated and not treated

The Flora treats all species (and infraspecific taxa) that we believed at the time of publication to be documented to be native to or naturalized in Virginia: 3,164. We did not treat an additional 815 taxa in four categories: recent additions to the known flora (5), unverified taxa (345), waifs (395), and incorrectly reported taxa (70).

Decisions over the inclusion (or not) of taxa are always difficult. Inevitably, there are long lists of species reported, but with information that is poor in various ways. An herbarium specimen may provide documentation that a species has been collected in the Flora area, but may leave it uncertain if the plant was cultivated, persistent, a waif, or truly naturalized. In the Flora of Virginia we were relatively strict in deciding to include questionable taxa Undoubtedly, though, additional taxa will over time move from "unverified" or "waif" to warranting full treatment as native or naturalized, new species will be described, and aliens not even on the radar will naturalize in Virginia.

Introductory chapters

The introductory chapters of floras vary greatly. In many cases they are relatively minimal: Radford, Ahles, and Bell's Manual of the Vascular Flora of the Carolinas has a total of only 6 pages. The 84 pages of introductory chapters in the Flora of Virginia greatly add to the usefulness and meaning of the book. The excellent "Historical Perspective" presents a broad perspective on how we have come to know what we do know about the flora of the eastern United States, from colonial exploration to increasingly "home-grown" study of the flora, and the broadening from the 1970s on of the endeavor from a largely academic pursuit to one led equally by conservation agencies and organizations.

Gary Fleming's chapter on the ecological context of the Virginia flora will be of general interest to anyone interested in the natural landscapes of Virginia. Moreover it provides the context for the detailed habitat descriptions provided for the taxa treated. His "Learning the Virginia Flora" suggests fifty readily accessible natural areas that cover the great diversity of Virginia's plant habitats.

Key to families

Ah, the dreaded "key to families", in some floras called the "Key to keys"… In the Flora of Virginia, we have tried to redesign this necessary evil to make it more user-friendly and effective for users of all levels of experience. Technical characters are pushed "low" in the key, and the key begins by getting the user to intuitive groups like "Key F. Woody angiosperms with alternate, compound leaves", "Key M2. Monocots with broad leaves", or "Key Q. Herbaceous dicots with whorled leaves on the stem". The "key to families" is a bit of a misnomer, as it actually often leads one directly to a genus or at least to a few genera in a family, such as "[*Diphylleia, Podophyllum*] Berberidaceae". Nearly all trees and shrubs can be keyed to genus without use of flowers or fruits. The keys are also structured to bring frequently confused genera into direct juxtaposition. So, for instance, [*Diospyros*] Ebenaceae and [*Nyssa*] Nyssaceae are side by side at couplet 25 in Key G6, [*Astilbe*] Saxifragaceae, [*Actaea*] Ranunculaceae, and [*Aruncus*] Rosaceae together under lead 20b in Key N1. "Key G7. Trees with alternate, simple, unlobed, toothed leaves" directly juxtaposes [*Celtis*] Cannabaceae, [*Tilia*] Malvaceae,

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Botanical Excursions

"Arrows from Heaven" — Thunderbolts & Oak Fissures

By George Ellison; Artwork by Elizabeth Ellison

My friend, Lee Knight—folklorist and singer good enough to perform at Carnegie Hall—has collected songs everywhere you can name. In Scotland an elderly lady who knew the earliest versions of many ballads still sung in the Southern Appalachians remarked: "Always remember that a ballad is a story … not always, but quite often, a sad one … so now, if you will allow, I shall sing you a story," as she launched into a twelve-minute long rendering of "Barbara Allen." I can't sing, but I shall tell you, if you will allow, a botanical story-tale—the old one about arrows from heaven and the golden bough.

The ridges bordering our place west of Bryson City are an extension of Noland Divide, which heads up below Clingmans Dome in the Great Smoky Mountains National Park. They descend via a series of outreaching ridges toward the Tuckasegee River and Fontana Lake. Nearly vertical in places these ridges are exposed year round to high wind, rain and ice, and high-voltage electrical events coming out of the west or southwest.

The dominant hardwoods along the narrow crests are various species of oak and hickory. The dominant oaks are white oak (*Quercus alba*), red oak (*Q. rubra*), chestnut oak (*Q. montana*), and what appear to be hybrids of *Q. alba* and *Q. montana*. Turbulent weather doesn't faze hickories. Noted for their toughness, they seem to hunker down and make it through most anything. But the oaks—especially Q. alba—catch hell from lightning in a contentious relationship that's been going on almost forever.

Sir James Frazer, whose vast twelve-volume study The Golden Bough (1890-1915, with a supplement titled Aftermath added for good measure in 1938) provides a comparative survey of the beliefs and institutions of mankind. Despite a multi-layered density involving fertility rites, the sacrificial killing of kings, the dying god, and the nature of the primitive mind, Frazer's thesis (advanced in support of his agnostic tendencies) was simple enough. He maintained mankind's intellectual "progress" could be traced from the magical through the religious to the scientific. His influence has been as much literary as anthropological, with Lawrence, Eliot, Pound, Faulkner, and others obviously in his debt for ideas and mythological underpinnings. And not a small portion of The Golden Bough (a wondrous accomplishment despite the fact that not a few of his conclusions are scientifically unacceptable) is devoted to our topic. His sacred "golden bough" was, after all, a mistletoe-bearing oak still smoldering in the flames of a lightning bolt. A century or so ago, Sir James Frazer wrote:

> *"It is a plausible theory that the reverence which the ancient peoples of Europe paid to the oak, and the connexion which they traced between the tree and their sky-god, were derived from the much greater frequency with which the oak appears to be struck by lightning than any other tree in our European forests, This peculiarity of the tree has seemingly been established by a series of observations instituted within recent years by scientific enquirers who have no mythological theory to maintain. However we may explain it, whether by easier passage of electricity through oak-wood than any other timber, or in some other way, the fact itself may well have attracted the notice of our rude forefathers … who might naturally account for it in their simple religious way by supposing that the great sky-god, whom they worshipped and whose awful voice they heard in the roll of thunder, loved the oak above all other trees of the wood and often descended into it from the murky cloud in a flash of lightning."*

We don't need to hear a rain crow kolping (as they sometimes do) or see the undersides of leaves on ash trees winking (as they always do) to know when the sky-gods are coming. A breeze drifts into the cove from over the western ridge. Cooler air casts a specter-like blanket of mist along the creek. Thunder rumbles in the distance. Clouds darken the sky. Electricity has been building in their churning interiors until positive and negative charges are concentrated near upper- and under-sides. Negative charges are attracted by positive ones from the ground. Once sufficient voltage has accumulated a series of faint leader strokes descend from above and activate streamers that flare from the ground. When the two meet, an electric pathway is forged between earth and sky. The current then recedes once again and gathers itself serpentine-like in the mother-cloud until a second return stroke produces the sudden flash we call lightning which blazes downward in zigzagged streaks that often fork just before the thunderbolt makes contact and cracks with a sudden sound as it strikes with disinterested fury whatever stands tall or all alone.

In his gnomic yet uncannily perceptive manner, Samuel Johnson—in the 1775 Dictionary—defined tree as a "large vegetable rising, with one woody stem, to a considerable height" and thunderbolts as "arrows from heaven." In general it is taller objects … not trees in particular … that attract lightning. It will strike various species of trees, of course, including oaks that are standing tall. Unfortunately for oak trees, when they do get struck their bark is configured for disaster.

In the world, North America, and the Blue Ridge Province of the Southern Appalachians there are in the genus *Quercus* of the family Fagacaeae the following number (more or less) of species: 500, 70, 20, depending on who's doing the counting. The mighty English oak of the ancients, *Quercus robur*, survived the last Ice Age and is still with us from western Europe to the Caucasus Mountains of Russia. In more recent times than Frazer was considering, *Q. robur* has served as the wood of choice for the British throne, Shakespeare's second-best bed, and the Mayflower. During World War II, Churchill's bunker in London was shored up with oak timbers salvaged from one of Lord Nelson's flagships. We have no oak with that sort of lineage in North America. But we do have *Q. alba*, the white oak, whose range covers most of the eastern United States. The British looked down on *Q. alba* until they underwent some attitude adjustment when their cannonballs bounced off the gun-decks and sides of the Constitution, as if they were made of iron.

Both *Q. alba* and *Q. robur* are grand trees, quite similar in that they are sturdy and long-lived. More to the point, both have evolved thick fissured bark, which serves as protective armor against herbivores; fire; adverse weather conditions, including dehydration; boring insects, and much more. And therein lies the irony of adaptive protection. The very bark that is such a safeguard on the one hand proves to be an Achilles heel when it comes to dealing with Dr. Johnson's arrows. In Red Oaks & Black Birches (1990) Rebecca Rupp explained the situation this way:

> *"One reason the hapless oak is singled out for all this heavenly fury is its bark, a rough, ridged production three to four inches thick [that's] formed by the vascular cambium, a busy sheath of actively dividing cells that is responsible for the tree's annual increase in girth. The cambium, rather like a magician whose right hand doesn't know what the left hand is doing, produces xylem—water-conducting tubules—to the inside, and phloem—food-conducing tubules—to the outside ... The phloem … lacks the expansive facility [of the xylem], and, as new phloem cells are produced the older layers are shoved outward, crushed, split, and shed … This battered and elderly phloem thus becomes a primary component of bark … Just beneath the bark lies the periderm … composed, in part, of a second cambium, called the cork cambium or phellogen, which divides to form clusters of air-filled cells known to the scientifically precise as phellem and to casual commoners as cork … Rough-barked trees, like our prototypic oak, have, in succession, numerous short-lived phellogens. Each produces a new batch of cork, forcing the older layers above it to stretch, crack, and eventually pull apart under expansive pressure, forming rough and ragged ridges."*

Not surprisingly, the tree's variable bark has been variously described. Emphasis has been placed on "whitish" coloration and "scaly" plates. The best concise description, to my way of seeing, is in E.S. and J.G. Harrar's Guide to Southern Trees (1946): "Bark—Light gray, variable, at first broken into scaly rectangles, later becoming thicker and divided into ridges separated by shallow fissures." A really up-close view of mature *Q. alba* bark reminds me of an aerial view of the incised landscape we call the Alleghenies: maze after maze of ridges and valleys, culs-de-sac, and fissures.

Many years ago on the high divide above our house a giant white oak was electrocuted in its own sugars when blasted by a lightning strike traveling at 60 miles per second. Nearby trees were spared because they did not stand so tall — and, even so, their smoother bark was uniformly wet. Any electricity from a strike would have flowed down their outer surfaces into the ground. But the oak stood taller; and its rigid bark plates had those dry ridges that

diverted the charge into the fissures, where tiny, almost invisible, sap channels allowed access into the oak's vascular tissues. The sudden influx of electricity — generating heat five times hotter than on the surface of the sun (50,000°F.) — instantaneously expanded the sap, which exploded and obliterated the tree.

Most strikes aren't that devastating. Sometimes the designated target is left partially split or topless or with a branch or two missing. Interior tissues may lie twisted on the ground. There might be vertical or spiraling bark seams infolded like scars on a boxer's face. Open wounds provide internal access for spores that germinate and become cankers or burls or heart-rot.

For Sir James Frazer such incidents were real enough. But they were also emblematic, he speculated, in the primitive mind of visitations from on high — visitations by an entity that left in the aftermath "a token of his presence or of his passage in the riven and blackened trunk and the blasted foliage." And Frazer also speculated that in our rude forefathers' minds, "such trees would thenceforth be encircled by a nimbus of glory as the visible seat of the thundering sky-god."

Sometimes these casualties will live on. Sometimes they won't. The very characteristic that protects also lets them down.

In closing, I hope you enjoyed this story and even profit thereby. I couldn't sing it like a ballad … as would my friend…. but I wrote it just for you and told it as best I can,

Note: "Arrows from Heaven," along with Elizabeth's artwork, will be included in a collection we are working on titled Near Horizons: Poems, Narratives & Images from the Southern Appalachians.

Contact: <www.georgeellison.com> & <www.elizabethellisonwatercolors>

Frazer, J.G. 1951. The Golden Bough: A Study in Magic and Religion. MacMillan, New York ("1 volume, abridged edition").

Harrar, E.S. and J.G. Harrar. 1946. Guide to Southern Trees. McGraw-Hill, New York.

McAdam, E.L. Jr. and G. Milne. (eds.) 1963. Johnson's Dictionary: A Modern Selection. Pantheon, New York.

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Mystery Plants

By Dan Pittillo

For the past year and a half we have been working through a set of seedlings that came up in a small tree-fall site on my hillside here in the Rich Cove habitat of Cane Creek at the foot of the Balsam Mountains in the heart of the Southern Appalachians. The contest began in Summer 2011 (Vol. 19[3]) and concluded this winter 2012 (Vol. 20[4]). The last two species were *Acer rubrum* (no. l) and *Cornus florida* (no. 2). Two dozen of you fine botanists entered the contest with some close results: Three of you tallied 9 or 10 correct identifications. The top score was by Judy Dumke of Ohio and runners-up were Georgia Hall of Maine and David Taylor of Kentucky. It was Judy that received the award of Timothy Spira's nice Wildflowers & Plant Communities book. Congratulations to the winner and thank you all for the spirited contributions!

What might be another contest? In travels to polar and tropical regions I often look for similarities in vegetation for those in the Southern Appalachians, which I'll define in a narrow sense as the Blue Ridge Province from the Roanoke River south to Springer Mountain in north Georgia. Of course many other species may occur in other surrounding provinces that could be more broadly defined as southern Appalachians. Most of our readers have at least visited this region and might have a general idea of which species would be present here. In addition, there are numerous references you could consult for presence. So, let's offer some images that I made in various travels and let you pick out those that would be found here. Let's keep this to only this year's effort and Judy Dumke has offered a copy of Kristin Johannsen's Ginseng Dreams, the Secret World of America's Most Valuable Plant to the winner. For this first set, pick out the correct one (or more) species that is native to the defined Southern Appalachians. I'll score the number right minus wrong so being more certain would give the better result. And you will have four sets to choose from by end of the contest.

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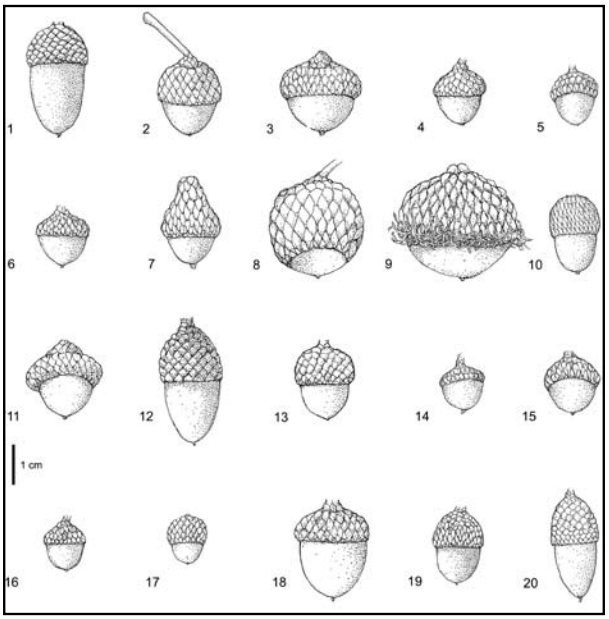
and [*Broussonetia, Morus*] Moraceae under key lead 7a. (*Celtis* is also keyed as untoothed and *Broussonetia* and *Morus* also keyed as lobed in other keys.)

Taxonomic Treatments

The taxonomic treatment is based on the taxonomic literature, old and new. This includes the reworking of families and genera based on molecular phylogenetic analyses (ironically, in many but not all cases, returning us to narrower family and generic circumscriptions similar to those used in J.K. Small's 1933 Manual of the Southeastern Flora). Unlike many floras or manuals that contain few or no references, the taxonomic decisions are discussed in the text and extensively referenced to the nearly 3000 references cited.

The accounts of families, genera, species, subspecies, and varieties are in five sections: Lycophytes, Pteridophytes, Gymnosperms, Dicots, and Monocots (the family key additionally separates the Eudicots and the "Basal Angiosperms"). Within each section families are in alphabetic order for ease of reference (a family index is also provided in the endpapers), genera in alphabetical order within family, and species in alphabetical order within genus. Each species has a technical description, avoiding unnecessarily technical terminology as much as possible (and an extensive glossary is provided), comprehensive synonymy to other floras frequently used in the area, and detailed habitat, range, and identification notes customized to Virginia and other mid-Atlantic states. For instance, the habitat for blackjack oak (*Quercus marilandica*) is described in Gleason and Cronquist's 1991 Manual of Vascular Plants of Northeastern United States and Adjacent Canada as "dry or sterile, especially sandy soil" and in Radford, Ahles, and Bell as "dry, poor soil"; in the Flora of Virginia it is described as "dry upland forests and woodlands; typically associated with poor soils, including alternately wet and droughty shrink-swell clays, xeric hardpans, deep sands, and shallow, nutrient-poor soils over acidic bedrock; frequent in the Coastal Plain and Piedmont; infrequent and confined to low-elevation ridges in the mountains".



Line drawings

Line drawings are provided for nearly half the taxa treated. Taxa illustrated were chosen to provide coverage of nearly all genera, common and frequently encountered species, and diversity of appearance within a genus. For instance, in *Hieracium* (the hawkweeds), 4 species are illustrated: *H. paniculatum, H. pilosella, H. scabrum*, and *H. venosum*, covering much of the morphological diversity within the genus. For some important groups, comparison plates are provided, showing for instance the leaves and acorns of the great majority of the Virginia oak species.

County dot maps are not provided. They are instead available at the Digital Atlas of the Virginia, maintained by Virginia Botanical Associates, where they can be regularly updated and easily accessed without adding additional bulk to the Flora. Likewise, detailed legal status and NatureServe / Natural Heritage rankin gs of rare species are not included, as these rankings change relatively rapidly and are better maintained in a more readily updated format than a Flora!

We think the new Flora of Virginia presents a new take on a traditional format. Floras are where "the rubber meets the road" for those who want or need to know the plants that grow in our fields, forests, suburbs, and cities. No-one can turn to thousands of monographs and publications in order to make a species list for a yard, natural area, or ecological plot. Floras were once written largely BY professors FOR professors, but we now have a broader constituency who need to be served by scientifically informed, but useable and practical tools to identify plants. Traditional floras depend almost strictly on flowers or fruits to key plants, often limiting the "keyable" time for a species to a few weeks, but many Flora users need to identify plants when they are there. We have tried to provide a Flora which enables plant identification across the growing season through the line drawings and keys based as much as possible on vegetative features, and that then also directly provides rich information about the identified plant. Future plans include the development of digital "apps" for plant identification.

The Flora of Virginia provides excellent coverage for many areas outside of Virginia. It will be an important work for use in adjacent areas where it provides 95-100 % coverage, such as the District of Columbia, Maryland, Delaware, southeastern Pennsylvania, West Virginia, southern Ohio, eastern Kentucky, northeastern Tennessee, and northern North Carolina, and very helpful and valuable in an even broader area of eastern North America where its coverage

BEFORE & AFTER: John Clayton (Dick Cheatham), with Flora Virginica *(1762), and Tom Smith (director of the Virginia Natural Heritage Program and Flora board member), with* Flora of Virginia *(2012).*

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is substantial but incomplete. Even as far away as southern Michigan, western Indiana, northern Mississippi, central Georgia, and southern New York, the Flora is estimated to cover as much as 90% of the plants in those areas, according to mapped analyses developed by the Biota of North America Program.

"We are proud to see this product come to fruition and to have been able to realize it with an eye to conservation," says Tom Smith, DCR's natural heritage director and a member of the Flora of Virginia Project's board. "The flora is going to be important to botanists, ecologists, planners and environmental consultants in finding, managing, conserving and restoring our native plant communities for generations to come."

To order a copy of the "Flora of Virginia," visit the Flora Project's website, www.floraofvirginia.org, and click the red button. The price is $79.99, plus $6.50 shipping. It can also be ordered from your local bookseller and from online sites.

BEREAVEMENT

C. Ritchie Bell, the last principle author of the Vascular Flora of the Carolinas, passed away March 6, 2013. A more complete tribute will appear in the next Chinquapin.

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also in Europe and Puerto Rico.

I have always enjoyed Chinquapin and looked forward to reading each issue, so my main goal as editor will be to maintain the great mix of entertaining and informative articles and news that we have come to expect. In that regard I want to recognize all the contributors whose articles fill the pages of Chinquapin: your great work is appreciated by the members and (especially) by the editor! I'd also like to invite anyone else to submit an article if you think it might be of interest to the SABS members - just send me an email and we'll discuss it. Finally, I want to acknowledge the outstanding job that Dan Pittillo has done as editor and interim editor of Chinquapin throughout most of its existence. I'm glad to report that Dan has offered to continue his Mystery Plants series, along with other occasional articles. Your contributions will always be welcome in the pages of Chinquapin, Dan. Thank you for all you've done to make it as delightful as the Southern Appalachian region it portrays!

"Homo sapiens putters no more under his own vine and fig tree; he has poured into his gas tank the stored motility of countless creatures aspiring through the ages to wiggle their way to pastures new. Ant-like he swarms the continents."

Leopold, Aldo. 1949. A Sand County Almanac. New York, Oxford University Press, p. 166.

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