Chinquapin

Volume 30 (1) Southern Appalachian Botanical Society Newsletter Winter 2024

Fairey Student Awardee Reports

Through the generous bequeathment of John Fairey, the society supports students to attend field stations. It is one of the ways SABS is committed to supporting student botanical research. Here are the reports from last year's Fairey researchers.

My Experience at Highlands Biological Station

Jonathon Osborne, Author

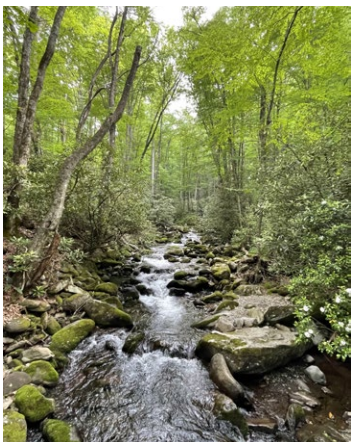
The two weeks that I spent in Highlands, NC was one of the most enjoyable and influential experiences of my professional career and one that I personally will never forget. Being surrounded by both the stunning natural beauty of the southern Appalachians and scientists truly inspired an atmosphere of active learning and deeper interest in the flora of this region and how they experience and interact with their environment.

With only limited experience exploring Appalachia, I knew that this course in Plant Ecophysiology would not only help familiarize me with different plant communities located therein but also help unite my love of plant systematics, biochemistry, and ecology. Knowing that Dr. Howie Neufeld was to be the professor only ensured me of those ideas as I knew him already to be a leader in plant ecophysiological research in the southeast. On the first day, we met early in the morning to have our first proper lesson on the background mechanics and physics of resistors, thermistors, etc.… an admittedly dry, but oh-so-important, aspect to understanding how the instruments operate that we were to use in our research projects later. Howie roused our excitement later in the afternoon with a short hike up to Sunset Rock near the station; this was quite a fun hike as I saw violets* still in bloom whose names I had long known but had never been formally introduced. Among these were *Viola cucullata, V. blanda, V. hastata, V. rotundifolia*, and *V. eriocarpa*! Knowing that we were to conduct a small ecophysiological experiment the following week, the gears started turning with every intention to include these plants in that experiment—unfortunately, it just wasn't meant to be, but more on that later.

**There were plenty of other intriguing plants too, but, hey, I'm a violet guy.*

At the height of the class, we took a day trip to the Great Smoky Mountains National Park to hike and explore different habitats such as spruce-fir forests, montane oak forests, and an Appalachian bald. Howie brought us to the highest peak in the national park, Clingman's Dome, where we met with the air quality specialist, Dr. Jim Renfro, who showed us the equipment they use as well as a thorough presentation on air quality research in the park. Howie then led us back down the path to the parking lot where we continued ever downward on a second hike to see Andrew's Bald.

Over the next few days, we all became intimately familiar with the use of the LICOR-6800 and CIRAS-4 portable photosynthesis meters (PPM) and their applicability to research. We used the PPM on plants around the station such as *Magnolia fraseri, Acer pennsylvanicum, and Kalmia latifolia* to obtain light response curves. We would also take a few leaves back to the lab to use in a pressure bomb to measure water stress or a spectrophotometer to measure chlorophyll/pigment content. Howie taught us all these methods along with a few others to introduce us to the tools at our disposal for our research project. When we first observed the plants' photosynthetic rate responses to altered light levels, I was met with a paradigm-shift in how I think plants respond-to and interact-with the world. I watched as the *Vernonia* responded to changing light conditions…in mere seconds. Now, maybe I was alone in my thinking; I always viewed plants as slow and steady in their responses to changing environmental conditions, but seeing that graph change dramatically in such a short period fundamentally altered how I view and interact with plants in my daily life as well as how I teach students in my Botany Labs at Southern Miss. These organisms are *much* more "alive" and responsive than most people give them credit for, even if we can't see it with our eyes.



Mountain stream

My group decided with Howie that the most appropriate idea for a research project given the short time we had to conduct it was to evaluate the difference in pigment content/concentration and photosynthetic capability in the leaves of Mountain Doghobble, *Leucothöe fontanesiana*.

(continued on page 4)

Hornworts in the eastern US Part One

Hornworts, members of the Anthocerotophyta, represent a relatively small and poorly known division of land plants, but one that spans the globe, reaching every continent except Antarctica. While often discussed only in context with the more speciose mosses and liverworts, the humble hornworts have their own unique features, including some that could affect global food security. In this article I provide a brief overview to the general biology of hornworts, with identification notes specific to our region.

Anatomy

Hornworts have a haploid-dominant life cycle, so the main body of the plant is gametophytic tissue. The thallus is variously strap-like, fan-shaped, or forms rosettes, with apical cells around the margins creating new growing points. Single-celled rhizoids grow from the underside of the thallus, and occasionally also the upper thallus surfaces in artificial conditions. Their function is primarily to hold the plant to its substrate, as the entire thallus can absorb water directly. Globose dark green colonies of cyanobacteria are often visible embedded in the ventral surface of the thallus. On the dorsal surface, antheridia, archegonia, and eventually, sporophytes emerge. Some species, especially *Anthoceros*, also develop lamellate outgrowths of thallus on the dorsal surface. In monoicous species, antheridia are first to appear, visible under a dissecting scope as bulges in the thallus. The thallus surface ruptures to expose the antheridia, which can number from one to a few dozen per chamber (though usually <10 in our region). The number varies within species, but can be diagnostic. Eventually the antheridia senesce, leaving pits visible to the naked eye. Archegonia, on the other hand, are nearly impossible to spot even under a microscope. Most of the time you only know where they were located after they are fertilized and develop sporophytes. The sporophytes emerge towards the end of the growing season, in most cases growing vertically with a ring of gametophytic tissue, the involucre, surrounding the base. The sporophyte is sustained by the gametophyte, the connection sometimes described as placental or haustorial. The base of the sporophyte contains an intercalary meristem and under unusually consistent conditions it can continue to grow indefinitely, to a length of >10 cm. In most species, sporophytes will reach a length of 1-5 cm before the tip matures, usually indicated by a color change to yellow, brown, or black. A dehiscence line opens near the tip, gradually opening downwards as the sporophyte dries, causing the capsule valves to curl open. Inside, a mass of spores and pseudo-elaters surrounds a central columella. Their appearance varies considerably among species, so the length and branching patterns of pseudo-elaters and shape, diameter, and ornamentation of spores are all prominent characters in keys. Asexual reproductive structures in different species may include gemmae, which have similar appearance to the thallus but fragment easily for dispersal, or tubers, which are toughened yellow-brown thickenings produced along the thallus margin or ventral surface.

Ecology

Hornworts are best considered as pioneer species, growing where little competition exists. Their most common habitat is disturbed mineral soil: trail banks, road cuts, fallow fields, and garden beds. In more natural settings, you can find them in persistently damp areas such as riverbanks or, if you're in the tropics, growing epiphytically on trees. Widespread species of our region seem to have overlapping niches, as it's not uncommon to find multiple species growing together.

Like their non-vascular brethren, hornworts are poikilohydric, lacking any ability to regulate water loss from their cells. In seasonally dry habitats, they can persist through drought as spores or specialized tubers. In some preserved collections, spores have germinated after 10 years (Proskauer 1958), though this can vary widely as green spores of the Dendrocerotaceae are short-lived. The lifespan of the tubers, as far as I know, has never been tested.

Unlike many mosses and liverworts, hornworts lack cold tolerance and will completely die back below freezing temperatures. An exception may be *Nothoceros aenigmaticus*, which

I've seen apparently growing happily in icy rivers in the Smokies and which grows poorly at room temperature in our growth chambers. An affinity for a colder climate may be linked to its ancestral range in high elevation páramos (Alonso-García et al. 2020).

Threats to hornworts, especially from climate change and other human activities, are poorly studied. One European example, *Anthoceros neesii,* is known only from cultivated fields, its natural habitat presumed destroyed. Changes in plowing times and fertilization regimes are thought to have contributed to its recent decline in range and abundance (Vanderpoorten and Goffinet 2009).

Little is also known about how hornworts are dispersed, particularly over long distances. Several species show evidence of broad intercontinental ranges, though often with population structure/cryptic speciation within continents. Divergence time estimates rule out exclusively plate tectonic or human mediated dispersal. With spore size and architecture similar to other bryophytes, wind probably plays a major role in long distance dispersal of hornworts, with circumstantial evidence for zoochory in distribution patterns between regions lacking wind connectivity (e.g. *Nothoceros aenigmaticus;* Alonso-García et al. 2020, Lewis et al. 2014).

Physiology

Hornworts have several features unique or rare among land plants. In many species, each cell's single chloroplast contains a carbon-concentrating mechanism called a pyrenoid, a membrane-less organelle that increases CO_2 concentration around the Rubisco enzyme. While common in algae, hornworts are the only land plants to retain this presumably ancient structure. Within the hornworts, pyrenoids have a wide variety of morphologies and were gained and lost multiple times (Villarreal and Renner 2012). Attempts to engineer a pyrenoid into crop plants are ongoing with the better characterized system of the alga *Chlamydomonas reinhardtii* (Fei et al. 2022). Given the closer phylogenetic distance between hornworts and crops species, it is more likely that the hornwort pyrenoid can function within angiosperms where the *C. reinhardtii* pyrenoid has failed.

Few groups of plants can form symbioses with *Nostoc* cyanobacteria. Under nitrogen-limited conditions, hornworts secrete a hormogonium-inducing factor that recruits *Nostoc* from the surrounding environment into slime cavities in the hornwort thallus, after which the *Nostoc* begins fixing atmospheric nitrogen and releasing ammonium. Which *Nostoc* taxa grow within the hornwort is primarily determined by the soil cyanobacterial community and is unlinked to the hornwort species or time of year (Nelson et al. 2021). An uncharacterized, but evidently complex, bidirectional signaling pathway exists between the cyanobacteria and hornwort (Chatterjee et al. 2022).

Hornworts are unique among bryophytes in producing high levels of rosmarinic acid (RA), a caffeic acid ester first identified as an active compound in several members of the Lamiaceae. The compound has since been discovered in numerous angiosperm orders, but only one other seed-free lineage, the fern family Blechnaceae (Petersen et al. 2009). It is unclear if this represents a conserved biosynthetic pathway dating to the origin of land plants that was subsequently lost in the liverworts and mosses. In the model hornwort *Anthoceros agrestis*, RA can accumulate to 5-10% of the dry mass of the plant (Vogelsang et al. 2006, Pezeshki and Petersen 2011). The role of RA is unknown but thought to deter herbivory/insectivory.

Peter W. Schafran

The Botanical Career of Frank Gilbert and the Founding of the Marshall University Herbarium: Part Two

Frank Gilbert prior to being hired on at Marshall College. (Marshall University Archives)

In part one of this article a case was presented that Frank Gilbert likely did not found the Marshall University Herbarium(MUHW). The question now arises that if Frank Gilbert did not found MUHW then who did. Things are less certain in this area. But I submit Lee Bonar as the most likely founder of MUHW. Lee Bonar was a native of West Virginia and attended Marshall College, graduating in 1916 with a two year academic degree.(Marshall University 1916) Bonar then entered the University of Michigan in the fall of 1916 and earned his bachelor's there.(Tavares 1979) He would go on to earn his masters and doctorate in botany at the University of Michigan specializing in mycology. He would spend his career at the University of California. There is, I think, good reason for tracing MUHW at least back to the summer of 1916. That summer Lee Bonar collected ten specimens between April and June which are still housed at MUHW today. Each of these specimens has only one label which reads "Marshall College Biological Museum." The antiquated language and there being no sign of any other label having been attached leads me to believe that these labels are original to the sheets. I have also not been able to find these labels on any later specimens, including specimens from Gilbert's tenure at Marshall College. It is reasonable to surmise then that these were the labels used in the pre-Gilbert herbarium and that the Bonar specimens are among the earliest specimens from MUHW.

Gilbert would teach at Marshall College until 1942. In 1942, despite Marshall President James Allen asking for a deferment, Frank Gilbert was called upon to serve in the Army. (Lee 1/31/42) Gilbert spent a couple of weeks in Lexington, KY before being sent on to Fort Hayes(also called Columbus Barracks) in Columbus, OH.(Gilbert 5/13/1942) While in Lexington Gilbert served on the Aviation Cadet Examining Board. Gilbert gives a hint in a letter

(continued on page 6)

Fairey Student Reports *(continued from page 1)*

Monarda

Several studies have indicated that increased anthocyanin production in leaves may result as a protective response to stresses such as high light exposure or nutrient deficiencies (Hughes et al., 2012; Jezek et al., 2023). This species is a thicket-forming, evergreen plant with yearly age classes of leaves that are distinguishable by their coloration, texture, and position along the stem axis. We chose 3 separate populations near the station and measured light curves for each leaf type at each population. Leaves of each class were then taken back to the lab for pigment analysis. Our results showed statistically significant differences between the photosynthetic ability of the leaves.

This type of research was entirely new to me. I grew to deeply appreciate this field and to recognize how much opportunity for research there is in ecophysiology! Almost every time we gathered data of different kinds on a plant species, Howie would chime in, "You know, you're the first person to ever perform [X] on *insert species*." Knowing the possibilities and usefulness, this field of study has spurred all sorts of research questions and ideas for my future studies of violets in the Southeast and beyond! It was truly such an unforgettable experience taught by a first-rate scientist with other amazingly intelligent and talented classmates.

References Cited

Hughes, N. M., Burkey, K. O., Cavender-Bares, J., & Smith, W. K. (2012). Xanthophyll cycle pigment and antioxidant profiles of winter-red (anthocyanic) and winter-green (acyanic) angiosperm evergreen species. *Journal of Experimental Botany*, *63*(5), 1895–1905. https://doi.org/10.1093/jxb/err362

Jezek, M., Allan, A. C., Jones, J. J., & Geilfus, C.-M. (2023). Why do plants blush when they are hungry? *New Phytologist*, *239*(2), 494–505. https://doi.org/10.1111/nph.18833

Jonathon Osborne

Field Course Gone Off Course

I am writing this report from the comfort of my sofa, post knee surgery reflecting on what may have been the missed opportunity of my summer field course. I am so lucky to have received the Fairey Field Station award for the Forest Ecosystems of the Southern Appalachians field course at Highlands Biological Station this past summer. It was an amazing opportunity and

Lauren A. Gray, Author

I was thrilled to be soaking up botanical knowledge from some of the best biologists in our region – Steph Jeffries, Alan Weakley, and Julie Tuttle, as well as our many guest speakers. Unfortunately, it got cut short for me on day four, after slipping and dislocating my knee on one of the old, wet, wooden bridges in Joyce Kilmer Memorial Forest. Because of this, I feel as though I am unable to write the report I thought I would be writing as I didn't get to experience the course in its entirety. I will, however, try to reflect as well as I am able on the wonderful days that I had there.

Micranthes

One of my biggest takeaways from the course was the people. The course gathered such a diverse group of people of many ages and backgrounds. I was the youngest there and slightly intimidated to be surrounded by so many people with seemingly more botanical knowledge than me as a graduate student about to go into my first semester. I was quickly put at ease, however, as the course and instructors fostered such a supportive learning environment, and I could not get enough of it! Everyone in the class was eager to learn from the professors, but always so excited to share with others some of their own knowledge and experiences. It was amazing to be able to hike around our beautiful region and get to learn about it straight from the source! I was dumbfounded by the amount of expertise around me, whether it was a weed growing in the parking lot to an undescribed *Blephilia* species along the trail, it was noted and talked about. Beyond identifying the flora and communities of the Appalachians, we also discussed some of the ethnobotanical uses as well as the biogeography of these mountains.

I got to experience so many different environments that would all have been seemingly the same to me had I not gotten to dip my toes into this course. I was able to see the nuances and unpack the story of each ecosystem based on the many organisms we found there. I felt as though I learned so much in just the few days that I was there, I couldn't imagine being able to stay through the whole course – I'd be unstoppable! I am so thankful to have been granted the funding to be able to take the course, and I only wish I could have stayed for longer. Whenever I am outside now, I am constantly thinking about the type of community I am standing in and what clues I can gather from the plants around me. In my current condition, most of these are parking lots with invasives or ornamentals, but I think back to some of my favorites: the *Halesia* with its chocolate bar bark along the elevation gradient of the Trillium Gap trail, the *Micranthes* on the rocky seepages at Whiteside Mountain and some members of the diverse herb layer, like *Sanguinaria* in the old growth forest of Joyce Kilmer.

Although I feel bad for receiving a scholarship for a course I was unable to complete due to injury. I can assure you that I deeply valued my time whilst I was there and am so grateful to have had the opportunity. I hope I can take this course again in the future. In the meantime, I will be working on my graduate studies and healing my new tendons, so I can get back outside and learn more about our beautiful region I love so dearly!

Lauren A. Gray

Under the Mistletoe

Mass infection on tupelo

Field botanists in most of the Southern United States are familiar with the oak mistletoe *Phoradendron leucarpum* (there are a diversity of synonyms for scientific and common names)—or are they? Why is the biology of this iconic dioecious denizen hosted by a diversity of dicot angiosperm woody plants so little known?

We asked some seasoned botanists in late December to tell us what native shrub was in full flower in mid-winter. Only one guessed it. Clearly the proverbial further research and education is needed hence this note to raise awareness of exciting studies in a forest near you.

We have been studying the oak mistletoe for several decades and are increasingly aware that there is much to learn. Because of the spherical habit of the shrubs, caused by its lack of geotropism, it is easy to discern and to observe that infections can be heavy on one tree while the adjacent tree of the same species and age has nary a mistletoe.

Knowing that fruits are dispersed by birds, we carried out an extensive study of winter distributions of fruit-eating bird species, finding seed dispersers to be much more widespread with regards to habitat than the mistletoe. Similarly, we found the distributions of commonly parasitized host tree species to be more widespread than the parasite. Thus, questions remain about variation in mistletoe abundance at both the individual tree and individual habitat patch scales. Evidence from a planting experiment suggests that variation in light availability could at least partially explain some distributional patterns through its effect on mistletoe establishment (Flanders et al. 2023).

Like any field study, numerous questions arose including floral biology. What pollinates the tiny flowers, among the smallest in our flora? Why winter flowering? A strong preference for deciduous trees (although rarely on red bay and live oak) suggests wind pollination but mistletoe flowers do not have an anemophily floral syndrome. While some literature reports swarms of insects visiting the flowers, we have only occasionally seen insects on any flowers.

Staminate flowers

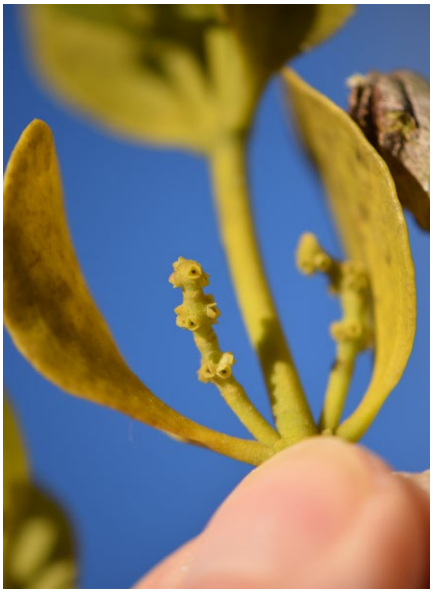
Most striking to us in our recent surveys is the way the mistletoe can change tree architecture. Prominent only in the winter are "witches' brooms" on red maple and tupelo as well as massive growths on the stems of tupelo. These are large infestations that produce adventitious stems from the original point of parasitism. They metastasize by sending green strands in the phloem that then grow sinkers into the wood, often along rays. This is essential since this mistletoe depends almost entirely on the xylem stream of the host.

Cedar wax wing foraging fruits

Another question to consider is the role these parasites play in nutrient cycling as well as biotic interactions. The role of frugivorous birds is well-known but there is little data on other biota.In the Southeast, oak mistletoe is the sole larval hostplant for the great purple hairstreak butterfly (*Atlides halesus*), yet apparent discrepancies between the abundance and distribution of these two taxa have not been examined to our knowledge.

Of course, any study seeking funding must implicate the role of global warming and mistletoe is a good research animal because of the isotherms relative to its distribution have been determined. This is especially relevant for those of us in the northern part of the South.

There is so much to learn about this common easily harvested plant. No, you do not need a crane to be a mistletologist. Despite the misconception it is possible to find hardy mistletoe shrubs within reach.



Pistillate flowers show three sepals and dark stigmata

Would you join us under the mistletoe and send us your observations? Of special interest would be observations of insects visiting flowers, birds eating fruits, heavy infestations, and parasitism of sweetgum (*Liquidambar styraciflua*) or other tree species that seem surprising to you.

Flowers of both sexes are less than 1 mm wide.

Nicholas P. Flanders and Lytton John Musselman

We thank senior mistletologists Dan Nickrent and Chris Randle for their help and encouragement.

Gilbert *(continued from page 3)*

as to what his responsibilities were at the examining board. He lists, "…making out morning reports, interviewing applicants and looking after some of the details always connected with an army post."(Gilbert 5/13/1942) In this letter Gilbert writes that he was transferred to Fort Hayes in Columbus, Ohio. Here Gilbert says that he was made president of the examination board. It is not clear how long he held this position, I will only note that both Staff Report(1989) and Boone(1965) state that Gilbert served in the Chemical Corps. Fort Hayes served as an in-processing center for new soldiers.(Bush 2007) This makes sense given Gilbert's work with the aviation examination board but it is unclear when Gilbert served in the chemical corps or in what capacity.

In 1944, having served his commitment to the army, Frank Gilbert was hired at the Battelle Memorial Institute(Battelle) in Columbus, Ohio.(Gilbert 9/15/1944) Information is difficult to find as to Gilbert's activities while at Battelle. However, there are some hints offered in Gilbert's writing from this period. For instance, Gilbert wrote that:

All botanical research at an industrial research institute is applied or, in other words, economic botany. A considerable portion is chemurgic and is concerned with the upgrading of a crop or plant product, or with uses for this product.(Gilbert 1958, p.405)

Gilbert here is probably describing the botanical work he saw around him at Battelle. Battelle was certainly an industrial research institute, and this quote matches up well with accounts of his research activity. He writes that in the years 1944-1952 he:

Conducted more than two-hundred field experiments, primarily on tobacco. The purpose was to determine the value of copper on soils which were not considered to be actually deficient in the element.(Gilbert 1952, p.158)

Gilbert's research from his Battelle years points to an interest in mineral nutrition in plants centering mostly on copper.

After working at Battelle for over a decade Frank Gilbert returned to teaching, this time at Union College in Barbourville, Kentucky. He appears as faculty in college yearbooks from1960-1973.(Union College 1960-1974) Gilbert shows up in the 1974 yearbook but at this point only as an advisor to the college's Kiwanis Club.

The botanical career of Frank Gilbert is remarkable for spanning over multiple states and across the military, private, and academic divides. Gilbert's career shows us what a botanical career in the 20th century could look like. He began in mycology, moved to vascular flora, and then moved into plant nutrition and food systems. He was the first president of the Southern Appalachian Botanical Club at a time when many scientific societies were being founded in America. His botanical career was not beyond the reach of historical events, and he found himself joining the war effort in 1942. As a student he joined the eradication efforts against blister rust. This prophesied a later interest in economic botany. At Battelle and Union College he was interested in agronomy, plant nutrition, and food systems roughly concurrent with Norman Borlaug's research and the green revolution. Both men were interested in the "upgrading of a crop or plant product." History could interrupt the botanical career and the botanical career could change the world.

Literature Cited

Boone, W. 1965. History of botany in West Virginia. McLain Printing Company, Parsons, West Virginia.

Bush, B. March 1, 2007. Taps for Fort Hayes. The Columbus Dispatch.

Culp, S.J., Beland, F.A. Malachite green: A toxicological review. Journal of the American College of Toxicology. 15(3): 219-238.

Gilbert, F. A.(1927, June 20). [Curriculum Vita]. University Archives, Marshall University, Huntington, W.V.

Gilbert, F. A. (1927, July 15). [Letter to M. P. Shawkey]. University Archives, Marshall University, Huntington, West Virginia.

Gilbert, F. A. (1937, August 10). [Letter to Munson H. Lane]. University Herbarium, Marshall University, Huntington, West Virginia.

Gilbert, F. A.(1942, May 13). [Letter to J. E. Allen]. University Archives, Marshall University, Huntington,West Virginia .

Gilbert, F. A. (November 15, 1944). [Letter to President of Marshall College(J.D. Williams)]. University Archives, Marshall University, Huntington, West Virginia.

Gilbert, F. A. 1952. Copper in nutrition. Pp.147-177 In A. G. Norman (Editor), Advances in agronomy. Academic Press, New York, New York.

Gilbert, F. A. 1958. Proceedings of economic botany conference. Economic Botany. 12(4): 405-420.

Gilbert, F. A. (1978, May 20). [Letter to Dan Evans]. University Herbarium, Marshall University, Huntington, West Virginia.

Jeffery, E.C. (1927, June 20). [Letter to M.P. Shawkey]. University Archives, Marshall University, Huntington, West Virginia.

Lane, M. H. (1937, August 2). [Letter to Frank Gilbert]. University Herbarium, Marshall University, Huntington, West Virginia.

Lee, R. A. (1942, January 31). [Letter to J. E. Allen]. University Archives, Marshall University, Huntington, West Virginia.

Maloy, O. C.1997. White pine blister rust control in North America: A case history. Annual Review of Phytopathology. 35. 87-109.

Marshall University.1896. 1896-1897 Catalogue of Marshall College, The State Normal School. Charleston, West Virginia.

Marshall University. 1916. 1916 Commencement Program.

New York Botanical Garden. 2022. Index Herbariorum.

Puppo, P., Thompson, L.2021. Partnering with archivists to process the manuscript collection present at the Marshall University Herbarium. The Vasculum. 16(2): 8-11.

Puppo, P., Gregg, K., Ford-Werntz, D., Keene, J., Cook, R., Vanderhorst, J., Mabry, M.

2022. West Virginia herbaria: Status, updates, and plans. The Vasculum 17(1): 7-12.

SABS. List of Past Presidents. Accessed 1/19/2023. https://sabs.us/people/.

Shawkey, M. P. (1927a, June 24). [Letter to W.H. Weston]. University Archives, Marshall University, Huntington, West Virginia.

Shawkey, M. P. (1927b, June 24). [Letter to Frank Gilbert]. University Archives, Marshall University, Huntington, West Virginia.

Staff Report. (1989, June 13). FRANK ALBERT GILBERT, 89, RETIRED PROFESSOR, DIES. Lexington Herald-Leader (KY), p. D8.

Tavares, I. I. 1979. Lee Bonar (1891-1977). Mycologia 71(4): 681–687.

Union College. 1960-1974. The Stepsean Yearbook. Internet Archive.

Weston, W.H. (1927, June 20). [Letter to M.P. Shawkey]. University Archives, Marshall University, Huntington, West Virginia.

Wherry, E. 1939. Recent fern finds in West Virginia. Castanea 4(1): 1-4.

Douglas Tuers

Botanical Brainteasers

By Joe Pollard and Janie Marlow

Our Brainteasers in the last issue [29(3)] were: (A) *Acer spicatum*, **mountain** maple; (B) *Sorbus americana*, American **mountain**-ash; (C) *Convallaria pseudomajalis*, American lily-of-the-**valley**; (D) *Kalmia latifolia*, **mountain** laurel; and (E) *Pycnanthemum incanum*, hoary **mountain**-mint. We've added some boldface there to make the solution to the puzzle more obvious. It's in the common names – four "mountains", and one "valley" – so answer (C) is the odd one out. But there are potential traps in the identifications. The American lily-of-the-valley can be hard to tell from its European relative, which is also naturalized in our area; however, we're pretty sure of our identification, based partly on its long leaves, but even more because this was a labelled specimen in the botanical garden at Highlands Biological Station! There are also nomenclatural controversies about this species: both *C. majuscula* and *C. montana* are now considered invalid synonyms (see references in Weakley's Flora). We'll also admit that the *Pycnanthemum* was difficult to identify to species from a black-and-white photo. Our problems with posting online color images are discussed further below.

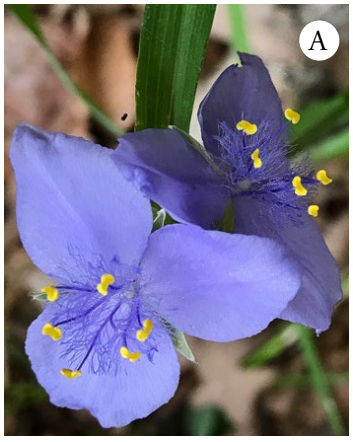
We received three entries this time. All of them got the mountain-valley puzzle correctly. All of them had good identifications but each had a few quibbles related to the picky details listed in the previous paragraph. There was really not much to choose among them, so we'll give the honor of first place to the answer received first, from Laura Nichols. Congratulations, Laura! This was also the final issue in volume 29 of *Chinquapin*, so it's time to declare a winner for the year. We've had three close contests, but only one reader submitted entries to all three of them, so the final result was clear: Donna Ford-Werntz is the 2023 Botanical Brainteaser champion and will receive a copy of *Darwin and the Art of Botany: Observations on the Curious World of Plants* by Jim Costa of Western Carolina University and the Highlands Biological Station. Hooray for Donna!!

Here's the first Brainteaser for 2024. Five pictures. As usual, we want you to identify all five of them and then tell us which one doesn't belong with the others. Here's a hint. There's only one gymnosperm, but that's not the point of this puzzle. It's not about pollination either. There's something that seems to be a common theme among the names of these plants, but really it only applies to four of them. Which is the odd one out?

All SABS members should have received an email recently from our President, about problems with the society's websites. The Council are working to remedy these problems, and when they succeed, you'll be able to access full-color copies of Chinquapin on http://sabs.us. But until then, we'll offer this work-around. If you want to see color images of the Brainteaser, just send a request to the email address listed below, and I'll send you all five color pictures in an email attachment.

Winners for each Brainteaser are based on accuracy of identifications, correct solution of the puzzle, and speed of reply. At the end of the year, we'll total up the points and award a prize (TBD) to the winner. Email your answers, or requests for color photos, to joe_pollard@att.net (that's an underscore character between first and last names).

[Photo credits: A, B by J K Marlow; C, D, E by Gill Newberry]



Send your answers to:
joe_pollard@att.net
(that's an underscore character between first and last names). Color photos that you can enlarge for a closer look are posted online at https://sabs.us/publications/#chinquapin.

Southern Appalachian Botanical Society
Appalachian State University
Department of Biology
572 Rivers Street
Rankin Science North 325
Boone, North Carolina 28608

PRSTD. STD.
U.S. Postage
PAID
Asheville, NC
Permit 575

Return Service Requested

In this issue:

Fulbright Workshop at the Annual ASB/SABS Meeting

Have you ever considered teaching and/or doing research abroad for a semester or a year? Or have you looked for ways to give your graduate students experience abroad? Or do you know colleagues in other countries that could benefit from a lengthy visit to your lab? If so, we encourage you to attend the Fulbright Workshop at the ASB/SABS meeting this March in Chattanooga. The Fulbright Program is one of several cultural and educational exchange programs sponsored by the U.S. Department of State that supports U.S. scholars and students abroad and foreign scholars who wish to teach and do research in the U.S.

The workshop will be led by four Fulbright alumni, three scholars (faculty members) and one student, who will discuss opportunities in the Fulbright Program and how these opportunities can enhance one's research, teaching, and personal fulfilment. Workshop organizers will provide advice on the application process and personal reflections on the benefits and challenges of working in other countries.

The workshop speakers will be Denita Hadziabdic-Guerry, a Fulbright Scholar to Ghana and now a Fulbright U.S. Scholar Alumni Ambassador, from the University of Tennessee-Knoxville; Mac H. Alford, Fulbright Scholar to Serbia and Zambia, from the University of Southern Mississippi; Lytton J. Musselman, Fulbright Scholar to Sudan, Jordan, the West Bank, and Brunei Darussalam, from Old Dominion University; and Jay F. Bolin, Fulbright U.S. Student in Namibia, now at Catawba College.

74th Annual Spring Wildflower Pilgrimage

Join members of the Southern Appalachian Botanical Society (SABS) for the 74th Annual Spring Wildflower Pilgrimage and experience the botanical wonder of the Great Smoky Mountains National Park like never before! Connect with fellow nature enthusiasts at this annual nonprofit event, sponsored by SABS, featuring professionally guided walks that explore the region's rich natural and cultural resources. Save the dates (May 1-4, 2024) and register this spring at www.wildflowerpilgrimage.org. We hope to see you there!