

Botany connections Bringing community together in the time of a pandemic

By Gary Krupnick, Eric Schuettelpelz, Rose Gullledge, and Erika Gardner

Among the biggest challenges for a research department during the COVID-19 pandemic have been continuing collaborations and maintaining community. National Museum of Natural History staff were sent home to telework almost two years ago, on 13 March 2020. Since then, most staff, research associates, post-doctoral fellows, interns, contractors, and volunteers have been working remotely with, excepting the past few months, only an occasional opportunity to return to the museum for brief visits. So how does an academic department keep up morale for their employees, associates, and volunteers who have been working for months in isolation?

The herbarium collections are a big part of why many of us do what we do. Plant specimens and their associated collections data are irreplaceable sources of information about plants and the world they inhabit. The collections provide the comparative material that is essential for studies in taxonomy, systematics, ecology, anatomy, morphology, conservation biology, biodiversity, ethnobotany, and paleobiology, as well as being used for teaching and by the public. The Department's collections and data management teams, in partnership with the Smithsonian

Digitization Program Office and Picturae (the Dutch-based digitization company), have been successful in nearing the completion of the digitization of the herbarium's pressed plant specimens. The images and the data online have been critically important in allowing many members of the staff to be productive in a remote, telework environment. It has been difficult for many researchers to be physically separated from the museum collections, having digital access to a large segment of the herbarium has eased that pain. Perhaps even

Continued on page 2

While the pandemic has led to many changes of where we work, how we work, and the kind of work we do, it has also uncovered unexpected opportunities.

Profile

Continued from page 1

more difficult, however, has been the isolation from colleagues.

While the pandemic has led to many changes of where we work, how we work, and the kind of work we do, it has also uncovered unexpected opportunities. For the past couple of years, various staff members have been making the effort to cultivate connections and build community within the Department of Botany. Highlighted below are several efforts and events that have proven essential in the well-being of Botany's collective workforce.

Before the pandemic, members of the Botany Department would gather semi-regularly for "Botany Teas". These breaks gave our members an opportunity to step away from their desks and catch up on happenings, learn from each other, and so-

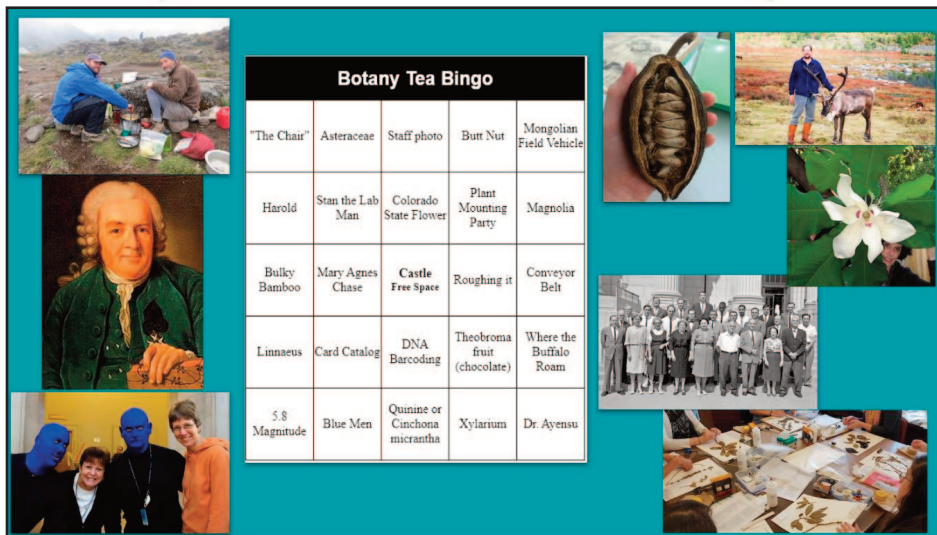
cialize. In a teleworking environment, these physical gatherings have not been possible. With access to Zoom, we have captured the spirit of the teas in a virtual setting. It has been a pleasure talking with colleagues and hearing about each other's lives. To provide a little levity, on occasion we even played trivia games. For Botany Bingo, participants submitted photos of: (1) unusual plants; (2) former staff members or current staff members as children; and (3) interesting field sites. During the meeting, images were displayed and those on the Zoom call would mark a bingo card with answers to each image. Such activities provided considerable laughter, along with some bonding and reminiscing.

At the onset of the pandemic, the specimen preparation volunteers were invited to partake in a 10-week "Botany Crash Course" via Zoom created by their super-

visor, Erika Gardner. Each week Gardner presented information about basic plant taxonomy and she would highlight key characteristics of three prominent plant families from A-Z. In total, 26 plant families were presented. After the course, Gardner provided botanical publications as training materials to each volunteer, essentially forming a Botany Volunteer Book Club. Among the books read were *Flora*, *Inside the Secret World of Plants* a Smithsonian and Kew collaboration publication, *Herbarium, the Quest to Preserve and Classify the World's Plants* by Barbara Thiers, and *Wicked Plants* by Amy Stewart. Thiers was invited to participate and give a presentation. Afterwards, Thiers sent the following message: "I had so much fun. Really a wonderful reward for writing the book. Please tell them all [the volunteers] how much I enjoyed talking with them." On a few rare occasions during the summer and fall of 2021, Gardner arranged for in-person lunch meetings. It was an extremely special moment to see each other in person for the first time in over a year and half. Due to the risk of the SARS-CoV-2 virus Omicron variant, the volunteers are back to biweekly virtual meetings with Gardner.

As in many academic units, our departmental seminars provide a chance to learn about the research of a visitor or staff member. The Botany Seminar Series has been a successful event held in the museum on many Thursdays at 2:00 pm. During the pandemic we were able to quickly transition to an online Webinar Series. While members of the department have missed meeting in person, this online approach has had several benefits. The webinar speakers no longer had to be onsite, and thus speakers have been invited from across the country and the world. The audience for the talks also changed. Those attending the webinars are not just the museum community, but also include colleagues from outside the Washington area. An email list is maintained of people who receive webinar notifications and Zoom links.

The Plant Press, the newsletter of the Department of Botany, transitioned years ago to a hybrid approach, with a mailed hard-copy newsletter and an online blog using the TypePad platform. The shutdown meant that a printed newsletter was no longer possible. *The Plant Press*, on the



Top: Botany Webinar Series flyers that were distributed over email. Bottom: Botany Bingo card with picture clues. Botany Bingo is a virtual trivia game played by members of the Department of Botany during the COVID pandemic.

other hand, has been able to continue during the pandemic with [pdfs of the newsletter available online](#).

The Smithsonian Botanical Symposium has been an annual event that the Department of Botany has co-hosted with the United States Botanic Garden since 2001. The pandemic forced the event to transition from NMNH's Baird Auditorium to Zoom, and like the Botany Webinar Series, the event has been able to reach a broader audience. The 18th [Smithsonian Botanical Symposium](#), "Plant symbiosis: The good, the bad, and the complicated," was successfully held over two days, on 13-14 May 2021. Those who viewed the proceedings joined from 22 countries. All aspects of the symposium were recorded and are available for viewing on the [Natural History for Scientists YouTube page](#). These recordings include the six speaker presentations, opening remarks, the presentation of the José Cuatrecasas Medal to Sebsebe Demissew speaking directly from Ethiopia, and roundtable panel discussions. The 19th Smithsonian Botanical Symposium was originally scheduled to take place in-person at NMNH and the U.S. Botanic Garden on Friday, May 13, 2022. However, due to the SARS-CoV-2 Omicron variant, it might be an entirely virtual or a hybrid event. This will be determined at a later date. The tentative topic is "Life on the Edge: Extreme Living in Plants." Check the [Department of Botany's website](#) for updates.

Pre-pandemic, recent publications from staff and associates were displayed on

a bulletin board in the Department across from the staff mailboxes. Posting of recent publications was an informative method of keeping Department members well-informed of recent research. When the pandemic began, the team behind posting recent publications came up with the idea of Botany Publication of the Week. A small committee was formed, including Rose Gullledge, Robin Everly, Alice Tangerini, Ken Wurdack, Erika Gardner, and Caly McCarthy, to review recently published articles and to select a publication to highlight in an email to the Department each week. They considered the following guidelines in their article selection: (1) anticipated impact, with a preference for high profile works; (2) significance, with a preference for books or other long-term projects; (3) authors, favoring a mix over time; (4) topic, aiming for a variety over time; and (5) visuals, including figures, photographs, maps, and tables. A weekly email that included the full article citation, the abstract, and a graphic with either quoted text or notable figures (or both) from the publication was distributed to members of the Department. Thus, the virtual display of publications continues to inform our staff of exciting and informative research that continues despite working remotely.

The Botany Department has traditionally done things differently when it comes to holiday parties. For the past few years, the Department has held parties in February or March to celebrate holidays like the Chinese New Year or St. Patrick's

Day. Each party brought the Botany community together to exchange potluck dishes and recipes, and to spread joy as we gathered together. The pandemic obviously threw a wrench into indoor gatherings, so the Department decided to have an outdoor event at Carderock Recreation Area in Potomac, Maryland. Botany members and their families gathered on 6 November 2021, a chilly but sunny day. It was designed as a family picnic and the potluck tradition continued. The picnic had grilling, birding, a birthday celebration, and a mean game of giant kickball. As most members had not seen each other beyond a Zoom screen in over 20 months, it was wonderful to be able to catch up, meet extended family members, laugh, and share stories of our times isolated during this unique period of our lives. Plans are already in play for a follow-up picnic in 2022 and an opportunity to get a group photo!



The Plant Press

New Series - Vol. 25 - No. 1

Chair of Botany
Eric Schuettelpelz
(schuettelpelze@si.edu)

EDITORIAL STAFF

Editor
Gary Krupnick
(krupnick@si.edu)

Copy Editors
Robin Everly, Bernadette Gibbons, and
Rose Gullledge

The Plant Press is a quarterly publication provided free of charge. To receive notification of when new pdf issues are posted to the web, please subscribe to the listserve by sending a message to listserv@si-listserv.si.edu containing only the following in the body of the text: SUBSCRIBE PLANTPRESS-NEWS Firstname Lastname. Replace "Firstname Lastname" with your name.

If you would like to be added to the hard-copy mailing list, please contact Dr. Gary Krupnick at: Department of Botany, Smithsonian Institution, PO Box 37012, NMNH MRC-166, Washington, DC 20013-7012, or by E-mail: krupnick@si.edu.

Web site:
<https://naturalhistory.si.edu/research/botany>

On the cover: Alice Tangerini hides behind *Magnolia macrophylla*. This photograph was one of several picture clues during Botany Bingo, a virtual trivia game played over Zoom that provided a little levity to members of the Department of Botany during the COVID pandemic.



A mean game of giant kickball: Eric Schuettelpelz, Paul Peterson, and Alice Tangerini enjoying themselves at the Botany Family Picnic, held at Carderock Recreation Center in November 2021. (photo by Ingrid Lin)

William (Bill) Louis Stern (1926-2021)

William (Bill) Stern joined the Smithsonian's Department of Botany in 1960 as the first Curator in the Division of Woods, a newly formed division that soon merged with the Division of Plant Anatomy. He was recruited by the Smithsonian from Yale University where he had been an instructor in the School of Forestry. "Instructor" may be a misnomer since it does not adequately convey the full breadth of his activities at Yale. He taught courses in wood anatomy and identification, tropical forestry, and plant microtechnique; edited the journal *Tropical Woods*; curated what was at the time the world's largest collection of wood (the Samuel J. Record Memorial Collection); and conducted research in wood anatomy as it related to angiosperm phylogeny. Also, while at Yale, he made two field trips to the Darien of Panama in 1957 and 1959.

A significant consequence of Stern coming to the Smithsonian was the concomitant acquisition of "The Archie F. Wilson Wood Collection." While studying for his Ph.D. at the University of Illinois, Stern had become acquainted with Wilson (1903-1960), a businessman, research associate of the Field Museum, and principal

in the International Wood Collectors Society (IWCS). Wilson's collection of 4637 wood specimens and its supporting library were arguably the finest private collection of wood and associated library in the world. The friendship and overlapping interests of Stern and Wilson resulted in Wilson's gift to the Smithsonian, at his death in 1960, of his extensive collection. This gift made the Department of Botany's wood collection the second largest in the U.S.A. and vastly improved its supporting library, now intercalated into the Botany and Horticulture Library. The Wilson wood collection remains the largest single donation from a private collector to our wood collection, which now holds more than 43,000 specimens and ranks among the largest and most significant such resources in the world.

In early 1963, Stern visited Panama with Richard (Dick) Eyde, a newly appointed fellow Curator, and Edward (Eddie) Ayensu, who would join the curatorial staff several years later in 1966. They collected herbarium and wood samples and investigated "mid-Tertiary" petrified fossil wood deposits in Herrera Province in the Azuero Peninsula. Later



William (Bill) Stern.
(photograph courtesy of The Washington Biologists' Field Club)

that same year, Stern took a leave of absence from the Smithsonian to work at the Forest Products Research and Development Institute in Los Baños, Philippines. His stay there was under the auspices of the Food and Agriculture Organization (FAO) of the United Nations. Once Stern returned to Washington, he became Acting Chair and then Chair of the Department of Botany from 1965 to 1967. The greatest challenge in this period was managing the department's move from the Smithsonian Castle to its present location in what was then the newly completed west wing of the Natural History Building.

Stern left the Smithsonian in 1967, but remained in metropolitan Washington, D.C. Initially, he was a Professor of Botany at the University of Maryland, College Park. While there, not only did he teach and continue his research, but he also was the founding editor of *Biotropica*, the journal of the Association for Tropical Biology. Leaving the University of Maryland, Stern moved back to D.C. and was a program officer for systematic biology at the National Science Foundation from 1978 to 1979. His next career move took him much further away from the nation's capital. From 1979 to 1985, he was Professor and Chair of the Botany Department at the University of Florida, Gainesville, and after relinquishing administrative obligations continued teaching and research until his retirement in 2002. In Florida, Stern shifted his focus from wood to orchid anatomy. The latter research culminated in 2014 with the publication of a volume on Orchidaceae for the multi-volume Met-



Bill Stern (left) with Mason Hale, David Gates, James Duke, and an unidentified woman at a reception for botanists at the James Smithson Bicentennial Celebration, September 1, 1965.
(photo by Smithsonian Institution)

calfe and Chalk *Anatomy of the Monocotyledons*. In retirement, Stern lived for a period in Hallandale Beach, Florida and at that time had an affiliation with Florida International University in Miami.

Stern authored numerous scientific papers as well as two books. In addition to the book on orchid anatomy, he coauthored a textbook with Oswald Tippo (1911-1999) of the University of Massachusetts, Amherst. *Humanistic Botany* (1977) was written for non-science undergraduates and illustrated by Alice Tangerini.

Stern was born in New Jersey on 10 September 1926. He died in Florida on 1 November 2021.

– Laurence J. Dorr

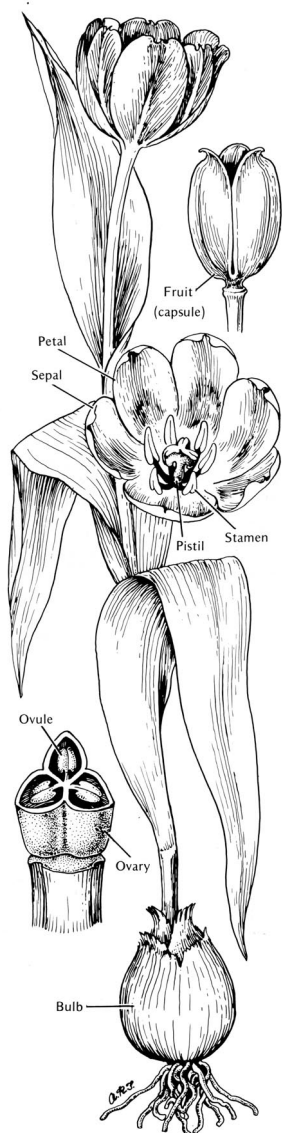


Figure 16.20 Tulip (*Tulipa*)



Bill Stern, date unknown. (photographer unknown)

A remembrance of Bill Stern

My first acquaintance with Bill Stern came through Edward Ayensu, the Chairman of Botany back in the 1970s. Dr. Stern was looking for an illustrator for his book, *Humanistic Botany*, which he co-authored with Oswald Tippo. Dr. Ayensu introduced us. In 1975 I had only been a Botany staff member for 3 years, but Bill arranged for me to take on the job as illustrator for the book although I was a complete novice at academic university books. Bill would joke

around about topics in botany, and he showed his sense of humor when he allowed me to illustrate the “Names and Naming Chapter” of the book with a horse wallowing among *Equisetum* culms. It was a learning experience which ended up improving my drawing skills as I had deadlines to meet. Bill always demonstrated his patience with me and encouraged me when I was questioning my ability to finish. We had the most fun going up to New York one weekend to meet the publishers, stopping at the Howard Johnson’s, and going to Carnegie Deli. I will always remember Bill as having a hidden humorous side behind the occasional serious exterior.

Left: An illustration of tulip (*Tulipa*) by Alica Tangerini for Bill Stern’s textbook, *Humanistic Botany*.

– Alice Tangerini

Eocene grass spikelet found preserved in Baltic amber

-Adapted from *Oregon State University*

Research from the Oregon State University College of Science and the Smithsonian's National Museum of Natural History has produced the first definite identification of grass in fossilized tree resin from the Baltic region, home to the world's most well-known amber deposits.

The specimen studied by George Poinar Jr. (OSU) and **Robert Soreng** (NMNH), named *Eograminis balticus*, also represents the first fossil member of Arundinoideae, a subfamily of the widespread Poaceae family that includes cereal grasses, bamboos and many species found in lawns and natural grasslands.

Findings have been published in the *International Journal of Plant Sciences* (182: 808-816; 2021 <http://doi.org/10.1086/716781>).

Blown or shoved against a resin-producing tree, the fossil grass lost one of its spikelets some 40 or 50 million years ago, along with an accompanying insect that had been feeding on it.

A spikelet is one unit of inflorescence, or flower arrangement, and consists of two glumes and one or more florets. A glume is a leaflike structure below the flower cluster, and a floret is one of the small flowers in the cluster.

The fossil spikelet is the first definite evidence that grasses were among the various plants in the Baltic amber forest.

"The discovery not only adds a new plant group to the extensive flora that have been described from Baltic amber but provides new insights into the forest habitat the amber came from, a controversial topic in this field of study," said Poinar, an international expert in using plant and animal life forms preserved in amber to learn more about the biology and ecology of the distant past.

Poinar says some scientists have proposed that fossiliferous amber from the Baltic region was formed in tropical and subtropical woods, and others say it came from a humid, marshy, warm-temperate forest.

"Our new grass suggests that for at least a time the habitat was warm-temperate, like you see today in mixed deciduous and conifer forests," said Poinar. "Present on the spikelet is an immature grasshopper-like insect and a leaf-spot fungal spore that



Side view of *Eograminis balticus*. (photo by Poinar & Soreng)

provide information on the microhabitat of the fossil grass. The spikelet has structural and developmental features that existed in early Cenozoic grasses and establishes an important calibration point for future studies on the origin and splitting of genera in its subtribe."

Because of the excellent preservation of the spikelet, observations could be made under direct light with both stereoscopic and compound microscopes, Poinar said.

"The spikelet has some features of members of the extant wetland genus *Molinia* in the tribe Molinieae, subtribe Moliniinae," Poinar said. "*Molinia* species are concentrated around the Baltic Sea, but some of those species' characteristics are

different from what we see in this fossil."

Informally known as moor grass, *Molinia* is a wetland genus. In addition to the Baltic region, *Molinia* is found in sand in habitats ranging from coastal to subalpine, and in fens and sphagnum bogs in forests. A fen is a peat-accumulating wetland that is fed by surface or ground water rich in minerals.

The *Eograminis balticus* spikelet specimen originated from the Samland Peninsula in the Kalinin District of the Russian Federation, Poinar said.

The name of the genus derives from the Latin words for age (*aeon*) and grass (*graminis*).

National Seed Strategy provides native seed progress

-Adapted from [USGS](#)

The Plant Conservation Alliance, a coalition of federal agencies and their Tribal, state and non-governmental partners with the goal to protect and restore resilient native plant communities, released a five-year progress report detailing coordinated efforts to increase the pace, quality and scale of native seed development and use in restoration efforts across our Nation.

The Plant Conservation Alliance published the National Seed Strategy Progress Report online to present progress towards meeting the increasing demand for native seeds to restore plant communities altered by natural or human-caused events on both public and private lands. The report is available at <https://go.usa.gov/xMvtA>.

Resilient native plant communities protect America's lands, mountains, streams, vulnerable coastal communities, and infrastructure from the effects of climate change and extreme weather events. Native plants are key to a restoration economy that engages our next generation of farmers, conservation professionals, scientists, and land managers. Like timber, our native plants and the Nation's native seed supply should be recognized, valued, protected, and managed as crucial natural resources. The National Seed Strategy provides a framework for a coordinated approach for planting the right seed in the

right place at the right time.

"We're proud of the work that's been done since 2015 to accomplish the goals of the National Seed Strategy," said Molly McCormick, an ecologist for the U.S. Geological Survey and lead author of the report. "We've made important inroads to meet the great demand for native seeds; however, there is much work to do, with an estimated 74% of U.S. plant species seeds still unavailable in the quantities needed for restoration."

The progress report highlights the Alliance's accomplishments in implementing the National Seed Strategy between 2015 and 2020. During that time, 380 Federal, Tribal, state and non-governmental partners, including the Smithsonian's National Museum of Natural History, reported progress toward the Strategy's goals across 50

states and two U.S. territories, implementing projects across more than 10 million acres of public and private land. This included 278 seed collecting teams making 8,862 native seed collections. Seed storage capacity increased to 2.1 million pounds at two facilities and more than 250 types of native seed are now available for large-scale restoration projects. There are now thousands of native seed crops from across 32



Image courtesy of the U.S. Geological Survey

ecoregions grown at more than 65 nurseries, farms, growers, and botanical gardens and through 21 regional seed partnerships.

"Native plants are the foundation of our most cherished landscapes," said Dr. Patricia De Angelis, chair of the Plant Conservation Alliance Federal Committee and botanist at the U.S. Fish and Wildlife Service. "By working across agencies and with partners to coordinate this science-driven effort to increase the supply of native plants, we are tackling climate change and supporting locally led restoration across the country. This is good for the environment and good for jobs."

The Bipartisan Infrastructure Law allocates \$200 million to implement the National Seed Strategy and lay the foundation and funding for the research, development and partnerships that are needed to meet the demand of restoring resilient native plant communities with locally adapted native seed. This Progress Report combined with the recommendations from the National Academies of Sciences, Engineering and Math's "Assessment of Native Seed Needs and Capacities," expected in early 2022, will help inform the update of the next version of the National Seed Strategy to more fully address national native seed needs in a changing climate.

The National Native Seed Strategy helps to meet conservation and climate-change-related objectives in many ways, including creating jobs in the restoration economy.



Image courtesy of the U.S. Geological Survey

A momentary thought in time: a letter from Siberia

By Julia Beros

Opening a letter lends an excitement unlike most paper-related activities. Perhaps through a pen pal, writing with an old friend, or even just a short anecdote on a pre-fab birthday card, letters beget a form of communication that sort of repels time and space; it is written in one scene, with a momentary intention and oblivious to the goings-on outside, and is then received in this very state in an entirely new place, for an intended (or accidental) audience who prepares to enter a brief hiatus from the goings-on of their surroundings. Something akin to time travel.

On one day, this year, I am helping a friend with some old family letters that need to be organized, and I lightly unfold an envelope that is not addressed to me, and it has not been opened or read for many years. In 1964 this envelope was sealed in western Siberia and sent to Los Angeles, California, where it was received as part of an ongoing personal correspondence between two Esperanto enthusiasts seeking to enrich their language skills. Reaching in to pull out the letter I find a few dried leaf bits that crumble out and I begin to carefully unpack the contents. Folded in lightly stained papers are two pressed plants, clung to each other by the pressure of time in this packed envelope.

With nothing else attached I carefully pry them off each other and look for familiar characteristics. Among them are some catkins and small serrate leaves that look almost undoubtedly like a *Betula*. I am fascinated by the layers of knowledge through the exchange of language and daily life in this penpalship that this correspondence developed, particularly in inspiring the curiosity of the natural world spanning continents and significant cultural divides.

With better investigation, I thought, maybe I could learn more about these mysterious birch “specimens” and I went to reference the Smithsonian collections. With a database of over 4,600 images of specimens flagged as “Siberia” there is a lot of diversity to view: alliums, poppies, geraniums, ferns, grasses, and some elusive Indets. “Siberia” is quite a broad search term (and could have many erroneous flags) and a very large region with different ecosystems spanning much of northern Asia.

Many Smithsonian researchers have



European white birch, *Betula pendula*, as photographed by R.A. Seelig at the State Arboretum of Virginia, Boyce, Virginia. Its native range extends from Europe into Siberia, China, and southwest Asia. It has been introduced into North America. (image courtesy of Smithsonian Institution)

worked and collected in areas of Siberia, but from very different regions within. Notable Smithsonian curator **Stanywn Shetler** (1933-2017) left among a long list of accomplishments a legacy of research in Russia setting a precedent for building international relationships through scientific endeavors. Known most for his contributions in Arctic North American flora, his interest in Russian language ultimately developed into a career long exploration of Russian flora. Having traveled to Russia and the former Soviet Union multiple times, he made significant contributions to

the U.S. - U.S.S.R. Botanical Exchange Program (commencing in 1972 as a bilateral agreement to address mutual environmental concerns to override the terse political relationship of the time) and served as an editor of English translations of Russian floras. His work in Russian botany led him and fellow botanists David Murray and Thomas S. Elias to collect plants in Tuva in the remote Russian Far East (one of the “obscure” places that Nobel physicist Richard Feynman had joked wanting to be the first American to ever visit, but didn’t get permission until after his death in 1988;

Shetler, Murray, and Elias visited first in 1983 for fieldwork).

A region that is incredibly biodiverse, Siberia has many facets of scientific interest. It inspires in some a sort of vast mystery, and in others a window into natural history. In the news as of late, geophysicist Sergey Zimov studies arctic geology in the arctic far reaches of Siberia. A founder of the “pleistocene park” he and other researchers are looking at different types of permafrost melt and trying to understand its implications, its role in the release of methane, and steps to slow these rapid changes. As biologically viable life forms both familiar and new (including disease causing bacteria) are literally thawed out and released from the ice, these researchers are discovering more about the history of this ecosystem and developing new perspectives on the “best” ways to recover its responsibility in the carbon cycle. Historically this was a grassland-steppe ecosystem traversed by mammoths that Zimov advocates a return to; that is, a desire to repopulate the area with grasses and herbivores (and perhaps in time even mammoths) as a hypothesized solution to protecting the permafrost and its stores of methane.

Botanists have long been thinking about and studying permafrost melt and using it as a marker of change. Having collected in the Russian Far East as well as far north as Nunavut and the northern slope of Alaska, Smithsonian Research Associate **Robert Soreng’s** work in grasses has led him too into the arctic ecosystems. As Soreng notes, “we have known about the potential for releasing methane and CO₂ for a long time” igniting a feedback loop of melting and methane emissions. Arctic natural history is a rapidly growing area of study right now as the permafrost quickly loses its permanence, which opens many questions for botany. With the melting of these time-capsules comes an explosion of information and an opportunity to apply knowledge of what has already been studied

Thinking back to that one piece of tiny, pressed birch branch from 1964 “somewhere” in Siberia unearthed from an envelope in a Silverlake kitchen in Los Angeles; this one “specimen” that somehow relates all these different areas of study and pieces of history, shows how crucial sharing knowledge is in fulfilling our responsibility to understanding and



A specimen of *Gentiana decumbens* from Tuva in southern Siberia collected on July 31, 1983 by Smithsonian curator Sanywn Shetler with Thomas Elias and David Murray.

being part of the natural world. Over time this pen pal reveals he has a deep interest in the natural world and works mostly as a farmer growing cucumbers, and while he does not explicitly say why he sent this plant fragment, this specimen represents the capability of scientific curiosity in connecting people. Our shared interest in the natural world connects us all beyond the bounds of time and culture and have us posing the same questions in new contexts.

As a letter represents a momentary

thought in time, so too does a botanical specimen or a layer of microbes and mosses frozen in permafrost represent a biological moment now surrounded by a new context. With the common interests of widening scientific and botanical knowledge and acting as stewards of the planet, we are able to develop new relationships across political boundaries. Science bonds the world at a higher level and has us continuing to ask questions as our world changes.

AWARDS & HONORS



Ken Wurdack is the recipient of the National Museum of Natural History's 2020 Science Achievement Award. NMNH began awarding Science Achievement Awards in 2003. The awards recognize exceptional scientific publications in natural history. In close consultation with the museum's Senate of Scientists, an interdisciplinary review committee recognized the outstanding work of staff scientists for five scientific papers and a book each published in 2020. The awards were announced during a virtual NMNH All-Science meeting on November 10, 2021.

Wurdack was recognized for his co-authored paper, "Pseudoflowers produced by *Fusarium xyrophilum* on yellow-eyed grass (*Xyris* spp.) in Guyana: A novel floral mimicry system?" (*Fungal Genetics and Biology* 144: 103466; <https://doi.org/10.1016/j.fgb.2020.103466>). The paper was written by Imane Laraba, Susan P. McCormick, Martha M. Vaughan, Robert H. Proctor, Mark Busman, Michael Appell, Kerry O'Donnell, Frederick C. Felker, M. Catherine Aime, and Kenneth J. Wurdack.

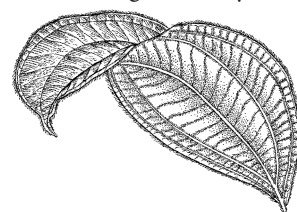
The paper presents a novel plant-fungus association where a newly described parasitic fungus, *Fusarium xyrophilum*, produces "fake flowers" that mimic its hostplant's flowers. These pseudoflowers are apparently adaptive to deceive pollinators which spread fungal spores and facilitate outcrossing (bringing together mating types). It is very different from any previously described fungal floral mimicry, especially in the plant and fungal species involved, with the pseudoflowers being composed of fungal tissues rather than host-plant modifications. The paper uses morphological, genomic, and biochemical data to support the ecological narrative, and has captured the attention of the popular science press.

Above: *Xyris surinamensis* inflorescences comparing similar flowers (left) and fungal pseudoflowers (right). (image by Ken Wurdack)

Science to Go features a lesson in botanical illustration

Alice Tangerini participated in an on-line STEM event, "Science to Go," organized by Karen McDonald, Education Director at the Smithsonian Environmental Research Center (SERC) in Edgewater, Maryland. On December 8, 2021, Tangerini presented a drawing segment live to students on botanical illustration featuring the marsh plant, *Lobelia cardinalis*. She worked with color pencils on paper and referred to digital photos which were supplied to the students. The activity, presented in Spanish and English, uses common household items to understand how marshes work. Tangerini was joined by SERC scientist Genevieve Noyce. The lesson plan is available at <https://learninglab.si.edu/collections/science-to-go-marsh-plants-teachers-students/rtI92wVkAPgnCSBi>.

"Science to Go" was created with the aid of grants by the Smithsonian Institution and the Smithsonian's American Women's History Initiative. The Science to Go project was designed to bring science to students, where they are, during the pandemic. Science kits were provided to students to use during live and recorded video. Each event featured a woman scientist at SERC or a scientific collaborator. Roughly 2,000 free kits were distributed to Anne Arundel and Baltimore public libraries, where students picked them up. The grants had also allowed SERC to host teacher professional development, offering kits to Prince Georges County Schools.



PUBLICATIONS

Anderson-Teixeira, K.J., V. Herrmann, C.R. Rollinson, B. Gonzalez, E.B. Gonzalez-Akre, N. Pederson, M.R. Alexander, C.D. Allen, R. Alfaro-Sánchez, T. Awada, J.L. Baltzer, P.J. Baker, J.D. Birch, S. Bunyavejchewin, P. Cherubini, **S.J. Davies**, C. Dow, R. Helcoski, J. Kašpar, J.A. Lutz, E.Q.

Margolis, J.T. Maxwell, S.M. McMahon, C. Piponiot, S.E. Russo, P. Šamonil, A.E. Sniderhan, A.J. Tepley, I. Vašíčková, M. Vlam and P.A. Zuidema. 2021. Joint effects of climate, tree size, and year on annual tree growth derived from tree-ring records of ten globally distributed forests. *Global Change Biol.* 28(1): 245-266. <http://doi.org/10.1111/gcb.15934>

Ballantine, D.L., J.N. Norris and H. Ruiz. 2021. The Marine Benthic Algal Flora of Puerto Rico, I. Ochrophyta: Phaeophyceae, Pelagophyceae, and Xanthophyceae. *Smithson. Contrib. Bot.*, No. 114. Smithsonian Institution Scholarly Press, Washington, D.C. <http://doi.org/10.5479/si.16709413>

Carvalho-Sobrinho, J., V.N. Yoshikawa and **L.J. Dorr**. 2021. Notes on Brazilian *Pachira* (Malvaceae, Bombacoideae) II: Additional typifications and new synonymies. *PhytoKeys* 186: 53-72. <http://doi.org/10.3897/phytokeys.186.71445>

Doherty, J.M., B. Williams, E. Kline, **W. Adey** and B. Thibodeau. 2021. Climate-modulated nutrient conditions along the Labrador shelf: evidence from nitrogen isotopes in a six-hundred-year-old crustose coralline alga. *Paleoceanogr. Paleoclimatol.* 36(5): e2020PA004149. <https://doi.org/10.1029/2020PA004149>

Gonzalez-Akre, E., C. Piponiot, M. Lepore, V. Herrmann, J.A. Lutz, J.L. Baltzer, C.W. Dick, G.S. Gilbert, F. He, M. Heym, A.I. Huerta, P.A. Jansen, D.J. Johnson, N. Knapp, K. Král, D. Lin, Y. Malhi, S.M. McMahon, J.A. Myers, D. Orwig, D.I. Rodríguez-Hernández, S.E. Russo, J. Shue, X. Wang, A. Wolf, T. Yang, **S.J. Davies** and K.J. Anderson-Teixeira. 2021. *alldb*: An R package for biomass estimation at globally distributed extratropical forest plots. *Methods Ecol. Evol.* <http://doi.org/10.1111/2041-210X.13756>

Gutiérrez, H., R. Castañeda, T. Gonzales, A. Sotelo-Mendez and **P.M. Peterson**. 2021. *Tripogon nicorae* var. *aristulata* (Poaceae), a new variety from Peru. *Phytotaxa* 523 (1):110-115. <http://doi.org/10.11646/phytotaxa.523.1.7>

Hu, H., A. Scheben, B. Verpaalen, S. Tirnaz, P.E. Bayer, **R.G.J. Hodel**, J. Batley, D.E. Soltis, P.S. Soltis and D. Edwards. 2021. *Amborella* gene presence/absence variation is associated with abiotic stress

responses that may contribute to environmental adaptation. *New Phytol.* 233(4): 1548-1555. <http://doi.org/10.1111/nph.17658>

Leclerc, N., J. Halfar, S. Hetzinger, P.T.W. Chan, **W.H. Adey**, A. Tsay, E. Brossier and A. Kronz. 2021. Suitability of the coralline alga *Clathromorphum compactum* as an Arctic archive for past sea ice cover. *Paleoceanogr. Paleoclimatol.* 37(1): e2021PA004286. <https://doi.org/10.1029/2021PA004286>

Ma, Z.Y., **J. Wen**, Q. Fu, and X.Q. Liu. 2021. *Vitis shizishanensis*, a new species of the grape genus from Hubei province, China. *PhytoKeys* 184: 45-54. <https://doi.org/10.3897/phytokeys.184.70045>

Patsis, A., R.P. Overson, K.A. Skogen, N.J. Wickett, M.G. Johnson, **W.L. Wagner**, R.A. Raguso, J.B. Fant and R.A. Levin. 2021. Elucidating the evolutionary history of *Oenothera* Sect. *Pachylophus* (Onagraceae): A phylogenomic approach. *Syst. Bot.* 46 (3): 799-811. <https://doi.org/10.1600/036364421X16312067913471>

Peterson, P.M., R.J. Soreng, K. Romasch-enko, P. Barberá, A. Quintanar, C. Aedo and J.M. Saarela. 2021. Phylogeny and biogeography of *Calamagrostis* (Poaceae: Pooideae: Poeae: Agrostidineae), description of a new genus, *Condilorachia* (Calothecinae), and expansion of *Greeneochloa* and *Pentapogon* (Echinopogoninae). *J. Syst. Evol.* <https://doi.org/10.1111/jse.12819>

Picard, K.T., H. Ranft, A.L. Grusz, M.D. Windham and **E. Schuettpelz**. 2021. When it only takes one to tango: assessing the impact of apomixis in the fern genus *Pteris*. *Am. J. Bot.* 108(11): 2220-2234. <https://doi.org/10.1002/ajb2.1761>

Poinar, G. and **R.J. Soreng**. 2021. A new genus and species of grass, *Eograminis balticus* (Poaceae: Arundinoideae), in Baltic amber. *Int. J. Plant Sci.* 182(9): 808-816. <http://doi.org/10.1086/716781>

Reback, R.G., D.K. Kapgate, **K. Wurdack** and S.R. Manchester. 2021. Fruits of Euphorbiaceae from the late Cretaceous Deccan Intertrappean Beds of India. *Int. J. Plant Sci.* 183(2): 128-138. <https://doi.org/10.1086/717691>

Walker, J.F., S.A. Smith, **R.G.J. Hodel** and E. Moyroud. 2021. Concordance-based

approaches for the inference of relationships and molecular rates with phylogenomic data sets. *Syst. Biol.* <http://doi.org/10.1093/sysbio/syab052>

Zuleta, D., G. Arellano, H.C. Muller-Landau, S.M. McMahon, S. Aguilar, S. Bunyavejchewin, D. Cárdenas, C.H. Chang-Yang, A. Duque, D. Mitre, M. Nasardin, R. Pérez, I.F. Sun, T. Leong Yao and S.J. Davies. 2021. Individual tree damage dominates mortality risk factors across six tropical forests. *New Phytol.* 233(2): 705-721. <http://doi.org/10.1111/nph.17832>



ART BY ALICE TANGERINI

Vallisneria spiralis L.

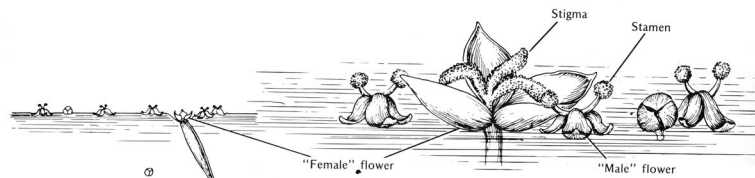


Figure 16.26 Eel grass (*Vallisneria spiralis*)

Humanistic Botany (1977), an undergraduate textbook co-authored by Bill Stern (1926-2021), was illustrated by Alice Tangerini. Among her illustrations is a drawing of eel grass, *Vallisneria spiralis*, chosen for its unusual reproduction process. Tangerini was recently able to match a photocopy of the plant habit that she used to a specimen dated 1880, ex herb. G. Genevier s.n. For the flowers, she used details from an old engraving, source not defined. The unusual composition was made to wrap around the description. The book includes a passage from the essay, "The Intelligence of Flowers," by Maurice Maeterlinck (1862-1949), poet, dramatist, and Nobel Laureate in literature:

Vallisneria is a rather insignificant herb, possessing none of the strange grace of the Water-lily or of certain submersed verdant tresses. But it would seem as though nature had delighted in imbuing it with a beautiful idea. Its whole existence is spent at the bottom of the water, in a sort of half-slumber, until dawns the wedding-hour, when it aspires to a new life. Then the female plant slowly uncoils its long peduncular spiral, rises, emerges and floats and blossoms on the surface of the pond. From a neighbouring stem, the male flowers, which see it through the sunlit water, rise in their turn, full of hope, towards the one that rocks, that awaits them, that calls them to a fairer world. But, when they have come half-way, they feel themselves suddenly held back: their stalk, the very source of their life, is too short; they will never reach the abode of light, the only spot in which the union of the stamens and the pistil can be achieved!

NATIONAL
MUSEUM of
NATURAL
HISTORY

Smithsonian

MRC 166 P.O. Box 37012
Washington DC 20013-7012
Official Business Penalty for Private Use \$300