

Montgomery Botanical NEWS

*Advancing Research, Conservation, and Education
through Scientific Plant Collections*

Fall/Winter 2019

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Montgomery Botanical Center
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To advance science, education & conservation of tropical plants, emphasizing palms and cycads, Montgomery Botanical Center grows living plants from around the world in population-based, documented, scientific collections in a 120-acre botanical garden exemplifying excellent landscape design.

Montgomery Botanical Center is a tax-exempt, nonprofit institution established by Eleanor "Nell" Montgomery Jennings in memory of her husband, Colonel Robert H. Montgomery, and his love of palms and cycads.

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**From the
Executive Director**



Dear Friends,

It was an intense summer at Montgomery! The team made major progress on the garden and landscape, started new scientific projects, built up the plant collection, and SERVED BOTANY.

The facing page shows a wonderful tribute to our founder. It is so fitting that Nell's emphasis on cycad science and hosting such talent at her home would lead to such an honor – I am deeply grateful for Dr. Erdei's gracious gesture. The Kelly Foundation honors Nell with a very generous gift (see page 7), ensuring her home can still serve as the best place to gather our botanical luminaries, supporters, and friends. To reflect these appreciations of Nell, we include an early photo on our back cover – she absolutely deserves our ongoing thanks for her wonderful vision and generosity.

I am also proud to show you the great results of our botanical explorations – page 4 recounts our palm mission in West Africa. We were honored to receive King Silondebil's blessing and encouragement: such ROYAL approval sets a high bar for future permissions! Michael (on page 6) describes how one of his numerous botanical forays contributed to a major scientific achievement. Finally understanding how all *Zamia* fit together into a complex genealogy sets the stage for many future studies – Michael deserves our applause!

Finally, I am thrilled to see the large number of early-career botanists, horticulturists, and students that have moved Montgomery forward recently. Generous support from donors, foundations and universities helps Montgomery reach new levels of student engagement every year (see page 7). Clearly, Montgomery is the ideal place to learn the trade!

These eight pages only show a small selection of what you have made possible, so please call, write or visit! Thank you for your help – *you grow this garden.*

Pictured: Dr. Griffith on the lawn northeast of Nell's House (see page 7).

On the Cover: Massive Baobabs and Ronier Palms dwarf these botanists in Casamance (see page 4).

The First *Zamia*

Nell Montgomery Jennings (page 8) founded Montgomery Botanical Center as a place where scientists could take full advantage of her diverse and robust cycad collection.

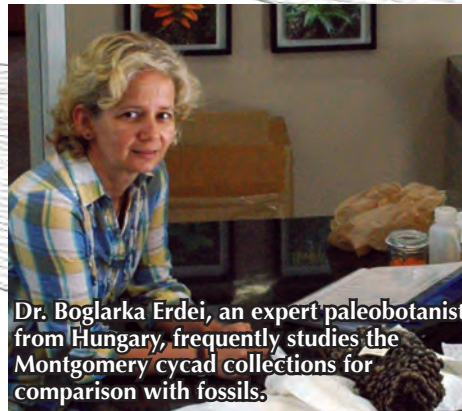
Honors our First Lady

Contact: Dr. Boglarka Erdei
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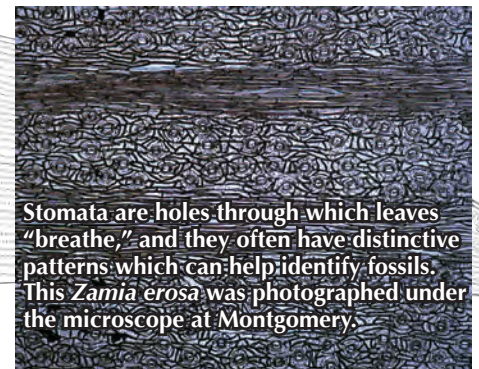
Recent research led by Dr. Boglarka Erdei of the Hungarian Museum of Natural History discovered that a fossil found years ago was in fact a *Zamia* – and represented the earliest example of any such plant in the flora!

Michael Calonje, Montgomery's Cycad Biologist, helped Boglarka to put this primeval plant in a context of modern cycads, by comparing the ancient specimen to the living collections of *Zamia* at Montgomery. The fossil, comprised of a single leaflet, was so well preserved that the very smallest details can be resolved. Careful examination of the shape, frequency, and alignment of the stomata – microscopic air holes on the leaf surface – showed that the fossil was not just a *Zamia*, but also that it shared remarkable similarities to present-day Caribbean *Zamia*, even though the fossil was found in Panama!

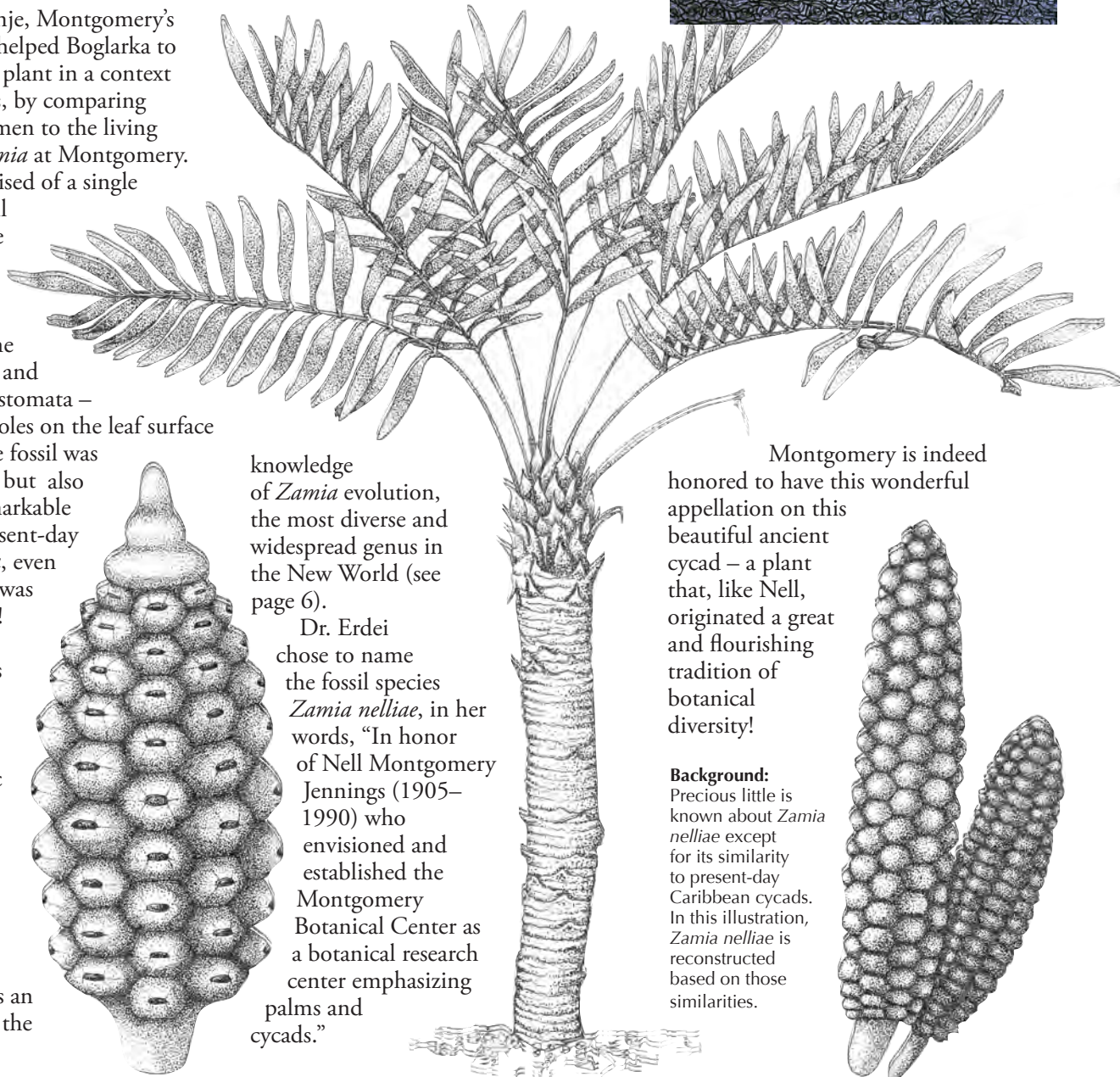
Although Caribbean zamias appeared more recently than *Zamia nelliæ*, these microscopic similarities show how Caribbean zamias still show some ancient characteristics. The discovery of this 34 million-year-old fossil fills an important gap in the



Dr. Boglarka Erdei, an expert paleobotanist from Hungary, frequently studies the Montgomery cycad collections for comparison with fossils.



Stomata are holes through which leaves "breathe," and they often have distinctive patterns which can help identify fossils. This *Zamia erosa* was photographed under the microscope at Montgomery.



knowledge of *Zamia* evolution, the most diverse and widespread genus in the New World (see page 6).

Dr. Erdei chose to name the fossil species *Zamia nelliæ*, in her words, "In honor of Nell Montgomery Jennings (1905–1990) who envisioned and established the Montgomery Botanical Center as a botanical research center emphasizing palms and cycads."

Montgomery is indeed honored to have this wonderful appellation on this beautiful ancient cycad – a plant that, like Nell, originated a great and flourishing tradition of botanical diversity!

Background: Precious little is known about *Zamia nelliæ* except for its similarity to present-day Caribbean cycads. In this illustration, *Zamia nelliæ* is reconstructed based on those similarities.

Senegal:

Montgomery had the unique opportunity to join Conservatoire et Jardin Botaniques Genève and Université Cheikh Anta Diop (Dakar) this past March on a scientific mission led by Dr. Fred Stauffer – a leading palm expert from Geneva who is also one of our Kelly Botanical Research Fellows at Montgomery. After extensive planning, the team set out to study the palm flora of Casamance – the remote southern section of Senegal. We gave special emphasis to biogeography and also ethnobotany, the way these palms are used by local people.

Basing our work out of Ziguinchor and Kolda, we sought palm habitats throughout Casamance, from the Atlantic coast, the banks of the enormous Casamance River, and through to the distant border with Guinea-Bissau. These explorations provided robust documentation of these diverse palms, with herbarium specimens, DNA samples,

photographs, seeds, and notes – as well as a multitude of local palm crafts for the museum. These efforts contribute directly to research by students at University of Dakar and Geneva, and are part of a broader effort led by Dr. Stauffer to extensively document the African palm flora, and to advance palm conservation.



Montgomery brought more seeds to Senegal than it took home! Seeds from 17 species at Montgomery were given to Parc Hann and University of Dakar Botanic Garden, enriching the palm collections at both gardens. Sharing plants is a cherished tradition of our founders, Robert and Nell Montgomery!



This expedition is the first to successfully obtain *Calamus deeratus*, now in the living collections at Montgomery and Geneva – these palms were previously unknown in cultivation!

Background: The team covered many miles in search of palms. In this area near the Forêt de Blaze, we found *Raphia*, *Calamus* and *Laccosperma*, as well as the common *Elaeis*.

Mission Scientifique

In each stop we were privileged to work directly with local experts including foret paramilitaires, park rangers, farmers, chieftains – and even A KING! We are deeply grateful for the abundant local and national collaboration, hospitality, support and permission for the Mission, and to the Plant Exploration Fund for financing this important project.

*M. Patrick Griffith, Executive Director
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Rangers from Parc national de la Basse-Casamance led the team to a remote site with abundant palm seeds.



The team was granted audience with King Silondebil of the Kingdom of Essaout. The King offered his approval and blessings, commending the team for their efforts to understand and protect the palms of his region.



A chieftain shows a basket fashioned from a *Borassus* leaf.



A palm wine maker showed us his harvest technique, using a fiber loop made from a different palm species!

The Zamia Family Tree

Looking back at a long-term effort



Jan, Michael, and *Zamia meermanii* in August 2008. Growing directly from sheer limestone cliffs in remote areas of Belize, these enigmatic plants are threatened by gravel mining.



The Phylogeny of *Zamia*: This diagram shows how all *Zamia* species are related to each other. Reconstructed with massive amounts of DNA data, this family tree reveals how this very diverse genus evolved and changed over time, spreading from the Caribbean and Mesoamerican regions into South America.

"I see them up there!" my Belizean colleague Jan Meerman exclaimed excitedly, binoculars in hand while pointing at a remote limestone cliff surrounded by water. It was 2008, and we were searching for an enigmatic species of *Zamia* that grew exclusively as a cliff dweller on scattered limestone hills in Belize. We waded through chest deep waters towards the plants, hoping no crocodiles were near, then carefully made our way up the steep limestone by gripping rock ledges and roots. After a hazardous hour, we finally reached five very large plants of this enigmatic species. It seemed to resemble the cardboard palm (*Zamia furfuracea*), but grew on sheer limestone like *Z. cremnophila*.

Detailed notes and pictures, herbarium specimens and live seedlings revealed that the species was indeed new to science, so I named it *Zamia meermanii* in honor of Jan who first discovered the unique cliff dweller. Perched on that humid tropical cliff, neither Jan nor I predicted our discovery would become part of a robust, multi-year analysis of all *Zamia*, conducted as part of my doctoral dissertation project at Florida International University. Surprisingly, MEERMAN'S ZAMIA is not closely related to those two Mexican species it resembles but belongs to a small group of Central American cycads with few obvious similarities – showing the value of bringing these distant, remote treasures together at Montgomery!

Michael Calonje, Cycad Biologist
michaalc@montgomerybotanical.org

REFERENCE: Calonje, M., Meerow, A.W., Griffith, M.P., Salas-Leiva, D., Vovides, A.P., Coiro, M. and J. Francisco-Ortega. 2019. A Time-Calibrated Species Tree Phylogeny of the New World Cycad Genus *Zamia* L. (Zamiaceae, Cycadales). *International Journal of Plant Sciences* 180(4): 286-314. The paper is open-access and freely available at the IJPS website. I am grateful to the many, many funders, gardens, colleagues and experts who made this study possible-please see the paper for the full list.

Background: Attracted by the bright orange flush of foliage, Jan Meerman and Patrick Griffith climb towards a group of scattered cycads.

Team News



Jack Bauer

Christina Dupuy

WE CELEBRATE TWO RETIRING EXPERTS. **Jack Bauer** retired after over 28 years of service as Facilities Supervisor. Jack's detailed knowledge of every structure, tool, and repair at Montgomery saw us through decades of progress and change, while keeping the historic charm of our 1932 buildings. **Christina Dupuy**, our longtime Tree Curator, retired in May. Christina brought extensive knowledge of local and exotic trees to Montgomery, and a vigilant focus on safety.

WE WELCOME NEW TEAM MEMBERS! **Eliza Gonzalez** was promoted to Collections Specialist, bringing training and experience in Museum Studies



Eliza Gonzalez

Julian Fiuza

Joel Zapata

to bear on our plant collection. **Julian Fiuza** was promoted to Landscaper I, dedicating special effort to improving the lake and swale edges. **Joel Zapata** joined as our Tree Curator, bringing great enthusiasm and diligence to this wonderful collection.

WE MOVE EDUCATION FORWARD: summer 2019 hosted more early-career horticulturists and botanists than before! **Hellen Lazowska**, **John Correa**, **Shawn Smith** and **Vanya Allen** joined as our 2019-2020 Conservation Horticulture Fellows, funded by the Batchelor Foundation and Christiane and Natalie Tyson. Two biology students from FIU, **Natalie Salman** and **Sarah Belfer**, study palm flower development through the Peter R. and Stuart Y. Jennings Internship and the FIU Tropics Internship. **Seth Purvis** and **Dylan Schreffler**, our GIS Interns from Eastern Carolina University, were generously funded by Lyman Dickerson to provide expertise on mapping and survey. **William McCutcheon** and **Leo Gorgatti**, both local high school students, worked at Montgomery over the summer, keeping up with the busy growing and planting season.



Hellen L.

John C.

Shawn S.

Vanya A.

Natalie S.

Sarah B.

Seth P.

Dylan S.

William Mc.C.

Leo G.

A Generous Gift to Restore Nell's House

Getting ready for nine more decades! A generous grant from the Kelly Foundation allows Montgomery to restore and improve Nell's House. New impact glass and a reconstructed and graded keystone patio will assure integrity of the famous structure, while returning its appearance back to a classic 1932 feel, by removing the necessary, but anachronistic hurricane protection (see background photo).

Nell's home is our "center of gravity" at Montgomery – sitting atop the ridge at the intersection of our vistas and connecting our vital contemporary work with the history and vision of our founder. With 87 continuous years as a home and office – the veteran of a dozen hurricanes – this solid building was again recertified by the County last summer. Nevertheless, issues with settling stones and water impediment prompted the Kelly Foundation to see the great need for a grand restoration.

"Kelly Foundation is proud to support the essential restoration of the windows and patio of this beautiful and historic home which serves as the heart of the Montgomery Botanical Center," states Christabel Kelly Vartanian.

Please join me in thanking the Kelly Foundation for this amazing gift, ensuring this wonderful gathering place will continue to inspire for many more years.

Background: Nell's House ready for Hurricane Dorian.

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FROM THE MONTGOMERY ARCHIVE

NELL MONTGOMERY AND HER PARENTS, EARLY 1950s



Nell, Isabel and Mac pose for a photograph just outside the front door of ELANAR — now known as NELL'S HOUSE — at the Coconut Grove Palmetum (AKA Montgomery Botanical Center). This 4.5" x 2.5" negative has no notes, but appears to date from the early 1950s. In the photo are a number of Colonel Montgomery's beloved palms, as well as his sundial awarded to commemorate 50 years in accounting (1889-1939). The Colonel's passion for palms and cycads, Nell's vision, and Nell's House remain vital to Montgomery's current success; see page 3 for a wonderful tribute to Nell, and page 7 for an important restoration of her home.