

The background of the cover is a photograph of a tall palm tree in a forest. The tree is the central focus, with its trunk extending from the bottom right towards the top. The forest is dense with various trees and ferns. In the distance, there are rolling hills and mountains under a cloudy sky. A person is visible at the base of the tall palm tree, providing a sense of scale.

Montgomery Botanical NEWS

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

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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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F r o m t h e
Executive Director

Dear Friends,

I am excited to send you this PALM ISSUE of our newsletter! As promised in our previous issue, here we focus on Montgomery's work with palms, and how that work helps advance the field of botanical science.

At the center of our palm studies is Dr. Larry Noblick. Since 1994, Larry's work for Montgomery has taken him around the globe, researching, collecting and conserving palms – over 2 decades of building our collections. Larry's first expedition to Madagascar in 1995 brought seed which are now stately *Bismarckia*, *Borassus* and *Hyphaene* anchoring the landscape of our longest vistas. Thus, I am glad he shares his return to Madagascar, along with his work in the Seychelles, on the facing page. Larry also furthered his explorations in the Caribbean and in the US, and these stories are featured on pages 4 and 5.

I am also very honored to tell you that Montgomery was selected for a new NATIONAL SCIENCE FOUNDATION AWARD (see page 6), to help protect and secure these plant collections. This level of federal support demonstrates how unique and valuable our living treasures are – such an award signifies high level recognition of how these plants help advance knowledge. We include some examples of those advances on page 6.

Montgomery has wonderful plans ahead for 2017 – further explorations, better improvements, and bigger science. We are gearing up for a major project to help advance how our plant collections can contribute to conservation efforts. I will tell you more about that in the coming months!

It has been a great year – thank you for everything you do to help move Montgomery forward. I look forward to seeing you here again soon – please call, write or visit.

Pictured: Dr. Griffith states: "We must include at least one cycad in this issue! This is our Florida native, *Zamia integrifolia*, in the Big Bend Wildlife Management Area. Fieldwork this year discovered a very small population even further west than previously known. I am glad to have these new collections at MBC, from a conservation project funded by the APGA (see page 7) and the US Forest Service."

Four new palms from the Indian Ocean

Exploring the Seychelles and Madagascar

The world's largest seed, the double coconut or Coco de Mer, *Lodoicea maldivica*, was reported by Ferdinand Magellan five centuries ago. Yet, its source remained a mystery until French sailors landed in 1768 on Praslin Island – previously called *Isle de Palmes* – the ancient granitic remains of a submerged mini-continent.

Today, Praslin is part of the Seychelles in the Indian Ocean and home of not only the double coconut, but four other endemic palms, each in its own genus. In 2015, I was able to collect all four of these. I am very excited about growing *Deckenia nobilis*, a beautiful crown-shafted palm with spiny clam-like bracts, *Verschaffeltia splendida*, a palm with magnificent prop roots and golf ball-sized fruits, *Phoenicophorium borsigianum* with beautiful nearly entire leaves, and *Nephrosperma van-houtteanum* with its bright red, cherry-sized fruits. All four of these palms are new species at Montgomery Botanical Center!

Next, we explored Ranamafana National Park in Madagascar with its photogenic lemurs and visited the sacred taboo Vatavavy forest. To visit Vatavavy, we had to respectfully request permission of the local chief by purchasing two bottles of the local rum: One as a gift for the chief, and other to leave at the grave site of the ancestors at the base of the mountain. Only after a brief ceremony there were we allowed to explore the mountain, home of many rare and beautiful palms.

I then flew to Ilse St. Marie for a meeting of the International Palm Society and explored the adjacent east coast by raft and on foot with the other directors. After the meeting, I set out on short trips with my guide to explore Andasibe, Mantadia, and Mitsingo forests in the eastern mountains where we encountered more lemurs and many interesting palms. Finally we drove to the last remaining forest on the central high plateau called Ambohitantely National park, where we encountered huge specimens of *Dypsis decipiens* (front cover). I am grateful for the generous support of Jill Menzel, who funded this very fruitful expedition.

Dr. Larry Noblick, MBC Palm Biologist
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Deckenia nobilis from the Seychelles



Yousouf and Larry with *Dypsis pilulifera*
Mitsingo Forest, Madagascar



Verschaffeltia splendida with prop roots

Caribbean Palm Collections

Drought and persistence



Coccothrinax alta on St. Thomas



Preparing a specimen of *Coccothrinax*

Of all of the palms on the US Virgin islands, only a few are native: *Coccothrinax alta*, *Roystonea borinquena*, and maybe *Sabal causiarum*. St. Croix, the largest of the islands, is riding on the northern edge of the Caribbean tectonic plate. St. Croix's rich soils come from Miocene sediments, whereas St. Thomas and St. John have rugged, volcanic terrain. Although only 40 miles separate St. Croix from St. Thomas and St. John, they are separated by a 14,000 foot underwater abyss where the North American and Caribbean plates slide past each other.

The islands of St. Croix and St. Thomas suffered a long drought which made seed collecting difficult. While thoroughly exploring a dry stream bed on St. Croix in Adventure Gut, Conrad Fleming, a local plant enthusiast, and Rudy O'Reilly of the USDA helped me find and collect seed of *Roystonea borinquena*. This magnificent Royal Palm has some of the largest trunk diameters in the genus.

I was fortunate to stay on St. Croix at the former home of Margaret Hayes, a famous island botanist, who accumulated a magnificent palm collection, including large numbers of native *Coccothrinax alta*. Native *C. alta* are quite rare on St. Croix with only a few persisting in the wild. This contrasts with large populations on St. Thomas where hundreds were seen with Duncan Bass, a local plantsman, near Mandahl. Although I collected herbarium specimens of *C. alta* on St. Croix and St. Thomas, unfortunately, I did not find any in fruit. Future fieldwork on these islands may yield this unique *Coccothrinax* for Montgomery.

Dr. Larry Noblick, MBC Palm Biologist
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A Palm Crisis

Helps complete our collection

Montgomery seeks to represent every palm species native to the United States. Thus, I recently visited the desert Southwest with my daughter to collect the well-known desert fan palm, *Washingtonia filifera* and close an important gap in our collection.

Our first stop was the Moapa Valley National Wildlife Refuge, in Nevada. The refuge was established to protect the Moapa Dace, a small rare fish that thrives in warm springs that emerge from the desert. Also found there is the northernmost population of desert fan palm. On that early November day, the temperature was in the mid 50s and we successfully made our collection. We were comfortably prepared for the temperature, but not for the rain, which left us soaked and shivering by the end of the day.

Our next stop was Thousand Palms, California. There, water wells up through the San Andreas fault line and nourishes healthy groves of desert fan palms. Magnificent palms display beautiful full skirts in the famous Thousand Palms Oasis, located in the Coachella Valley. We easily collected our limit from the palms in full fruit with the help of Ginny Short, Preserve Manager, and Deborah Rogers, the Preserve Director.

Finally, we explored a little-known relict population of desert fan palm in Southwest Arizona. In a steep, narrow arroyo in the western end of the Kofa Mountains, direct sunlight only shines between the canyon walls for a few hours each day, and water draining off the mountain plateau sustains a small palm population.

Although identified as *Washingtonia filifera*, these palms were much smaller, had thinner stems and smaller and fewer leaves. Fire-charred trunks on many explained the lack of skirts. Discovered in 1923, O. F. Cook, a USDA botanist, proposed the new name, *Washingtonia arizonica*, which was never accepted. While distinct from specimens in Nevada and California, it is unknown if these differences are genetic or environmental. Perhaps further investigation of collections can help answer these questions.

I am very grateful to the late Lillian Fessenden for supporting this project to help complete our collection of native palms, and for all of the many expeditions she supported at Montgomery over the years.

Dr. Larry Noblick, MBC Palm Biologist
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Washingtonia arizonica is an old name for the palms in this canyon.



Orange safety vests were required on this first day of hunting season.

National Science Foundation Invests in Montgomery's Plants

Montgomery's plant collections are recognized by the NATIONAL SCIENCE FOUNDATION (NSF)!

To advance science, the NSF supports a limited number of important living collections which are heavily used by researchers. This year, Montgomery received an award from the NSF COLLECTIONS IN SUPPORT OF BIOLOGICAL RESEARCH program, to ensure the security of these valuable collections.

South Florida is known for frequent lightning and high winds, which lead to power outages. Young seedlings in the nursery and stored pollen depend on consistent power for environmental control, which ensures their survival. Thus, the NSF will provide automatic generator systems for the Chris Tyson Plant Conservation Building and the Loyd G. Kelly Conservation Nursery, to help secure these scientific resources for future research. Quoting from the NSF website:

[MBC] provides the most diverse and thoroughly documented collections of palms and cycads in the US, through its historic and ongoing plant exploration fieldwork, as well as its location in frost-free, subtropical South Florida. In addition, to their use in research and education maintaining these collections reduces the need for field collecting, preventing the extirpation of species from their natural habitats.

Most living research collections supported by NSF are microbes — bacteria, yeast and algae. Searching the NSF archives, it appears that MBC is the first botanic garden plant collection awarded this support — further demonstration that Montgomery is a leader in this important area of plant science.



Pollen is stored at minus 80 degrees centigrade at Montgomery.



Cultivating palm Discoveries

Further validating that NSF award, some brilliant new science made great use of our plant collections. Keeping with this issue's palm theme:

Palm Biogeography

Two important studies illustrate how palms diversified. First, a paper led by Jason Comer of the University of Georgia shows how and when a major subfamily of palms originated in the Western Hemisphere. A second paper led by Cintia Freitas, who visited MBC from Brazil last year, details how and where *Attalea* originated in Brazil's Atlantic Forest. MBC's Larry Noblick and USDA's Alan Meerow were coauthors on the *Attalea* research.

Palm Anatomy

An important study of flower development in *Chamaedorea* and *Hyophorbe* used MBC's collections. Led by Felipe Castaño, the paper was coauthored by Fred Stauffer from the Conservatoire et Jardin Botaniques de la Ville de Genève. Fred is also a Kelly Research Fellow at MBC.

Palm Fossils

Led by Paleobotanist Steven Manchester of UF (Gainesville), careful comparison of fossils from India with MBC's palm collection found that dispersal of South American palms occurred earlier than thought — perhaps up to 64 million years ago. This important finding is consistent with the new studies mentioned above — and shows how MBC collections cultivate discoveries in many ways!

For complete details, please see www.montgomerybotanical.org

Botanic Garden Experts

Gather in Miami



Montgomery was honored to co-host the largest garden event in 2016: the American Public Gardens Association Conference. The event brought together over 750 botanic garden experts from around the world to see the very best horticulture and plant collections of Miami – and embrace the theme “*Changing Perspectives: Planting for the Future.*”

Montgomery worked with 12 other gardens to host the gathering: Block Botanical Gardens, Kona Kai Botanical Garden, The Preston B. Bird & Mary Heinlein Fruit & Spice Park, The John C. Gifford Arboretum, Miami Beach Botanical Garden, Mounts Botanical Garden, Naples Botanical Garden, The Kampong of the National Tropical Botanical Garden, Pinecrest Gardens, USDA-ARS, Vizcaya Museum & Gardens, and Wertheim Conservatory of FIU. This level of local garden cooperation is UNPRECEDENTED – and has forged a lasting local network that continues into the future.

Patrick Griffith, Michael Calonje, and Tracy Magellan from Montgomery attended the conference and gave six presentations, on topics from collections management, to leadership, to coping with hurricanes! With the dedicated work of our local gardens, our volunteers, our speakers and our guests, and through a local collaboration *never before seen*, we raised the bar for horticulture in Miami!

We are grateful for our very generous sponsors who made this event possible: USDA, FIU, Berends Hendricks Stuit, and Tom Kenan – thank you!



One highlight of the conference was a study tour for plant collections at Montgomery.

Team News

Arantza Strader, Database Supervisor, retired this summer for a well-deserved rest after 14 years of excellent work. **Claudia Calonje** was promoted to Database Supervisor, where her very specific skills with computers, plants, and record keeping will be put to great use. **Jessica Sparks**, our 2015-2016 Conservation Horticulture Fellow, was hired long-term as our new Seedbank Coordinator, and is moving the program forward with great enthusiasm! Our other recent Fellow, **Marco Perez-Alvarez**, has also been promoted into a long-term horticulture position – and brings a careful hand and diligent work ethic to the team. Our 2016-2017 Conservation Horticulture Fellows, **Daniella Fernandez** and **Glenn Gonzalez**, join us from Miami Dade College and Pinecrest Gardens, bringing garden experience, great spirits, and eagerness to learn plant work. **Dr. Joanna Tucker Lima**, our new Living Collections Manager, began work at MBC this summer. Joanna brings important experience with palms, fieldwork, plant research, databases, and mapping to MBC from the University of Florida in Gainesville, where she recently completed a postdoctoral fellowship. Joanna’s record of planning, starting, following through, and FINISHING great work make her a wonderful addition to the MBC team!



Arantza Strader



Claudia Calonje



Jessica Sparks



Marco
Perez-Alvarez



Daniella Fernandez



Glenn Gonzalez



Joanna Tucker Lima



FROM THE MONTGOMERY ARCHIVE

ROBERT AND NELL MONTGOMERY ENJOY COCONUTS, CA. 1936.

Robert and Nell enjoyed harvesting the fruits of their collection, and numerous photographs in the Montgomery Archive highlight the great variety of tropical fruits they enjoyed. Here, Robert and Nell predate the modern coconut water trend by about 80 years, with the freshest available source.

The coconut, *Cocos nucifera*, is considered one of the world's most useful plants, and is certainly the most widely grown and utilized palm species. Inspired by Robert and Nell, the MBC Team harvested, chilled and served coconuts and lychees from its plant collection for guests of our recent garden conference (see page 7) – a novel treat for many of our guests who traveled from much further north.

