

A Tree Grows in Managua

TEXT AND PHOTOGRAPHS BY DANIEL MOUNT



According to President Daniel Ortega, “in Nicaragua everybody is considered to be a poet until he proves to the contrary.” This certainly is true of Dr. Juan Bautistas Salas Estrada—botanist, author, poet and founder of the Arboretum Nacional in Managua.

Salas had spent over 50 years of his life studying the incredibly rich and diverse flora of his small country. Nicaragua is about two-thirds

the size of the state of Washington and lies at the center of Central America—the southernmost isthmian portion of North America, which first rose from the ocean as a chain of volcanic islands. In the late Cenozoic Era, about the same

time the Cascade Range came to its “modern” position, it became a sub-continental land mass. As it joined the two Americas, it precipitated a bio-geographical event called the Great American

ABOVE: Profs Carénas and Delgado with translator Michael Boudreaux.

INSET: Recently planted tree seedlings waiting to sprout in the open air “greenhouse.”



At the center of the intersecting paths of the arboretum.

Exchange that allowed plants and animals, long separated by water, to migrate into new territory.

Nicaragua is located at the center of this isthmus and has a topography much like our own—mountainous, volcanic, pocked with lakes and crisscrossed with rivers. It also enjoys a dry and a wet season similar to ours, only in reverse; winters are dry and summers are wet there. And Nicaragua is prone to the same cyclical climate fluctuations from El Niño and La Niña that we experience. But it is there that most similarities end. As part of the neotropics, one of the eight eco zones on Earth, which includes more tropical rain forest than any other ecozone and some of the most important reserves of biodiversity on the planet, it definitely differs. The average temperature ranges between 68 and 86 degrees, with yearly rainfall from 28 inches on the dry Pacific slope to nearly 250 inches in the southeastern rain forests. Managua lies at the center of the country's climatic variables and diverse topography on the plain situated between Lake Managua and Lake Nicaragua, about 400 feet

above sea level. At the center of the city—which, like most modern-growing cities, sprawls endlessly in many directions to accommodate the million plus inhabitants—flourishes the rather small arboretum of Juan Bautistas Salas Estrada. Its mere 3.7 fenced acres—hosting over 235 species of trees, most of which are native to Nicaragua—is part of the capital's governmental center, near many foreign embassies, and within walking distance of the National Palace.

It is no coincidence that Salas' arboretum, an idea he formed during his years working as director of INAFOR (Instituto Nacional Forestal) was placed so centrally in the capital. It serves not only as a cool and shady park in an urban area covered in concrete and buildings, but also as a visible metaphor for the new Nicaragua's interest in preserving its forests.

During the 45-year despotic rule of the Somoza family, over 60 percent of the forests of Nicaragua were destroyed and most of the trees felled and exported by multinational companies, leaving little or no economic benefit



Neem Tree seedling.

behind. After the revolution—which put the Sandanistas in power in 1979 and spawned a counterrevolution, a U.S. embargo, and many years of economic hardship for the Nicaraguans—the forests continued to suffer more predation, with many species on the brink of extinction. Today Nicaragua is enjoying more peaceful times and, with the re-election of former Sandinistan president Daniel Ortega, is taking on vast reforestation projects. Between 2006 and 2010, nearly 161,000 acres were reforested, while another 26,100 acres are proposed to be replanted in 2011. This is not a program by INAFOR alone, but collaboration between environmental groups from around the world, the UN Food and Agriculture Organization, and about 467,000 Nicaraguan students. At the center of this furor of planting is the National Arboretum, the result of Salas's persistent love of trees despite revolutions, earthquakes and economic collapse. Salas—imprisoned by the new revolutionary government from 1979-1980, while his wife and daughter fled to the United

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LEFT: The strange young excrecent fruits of jicaro, *Crescentia cujete*.

RIGHT: Entrance to the visitor center with guava on the right.

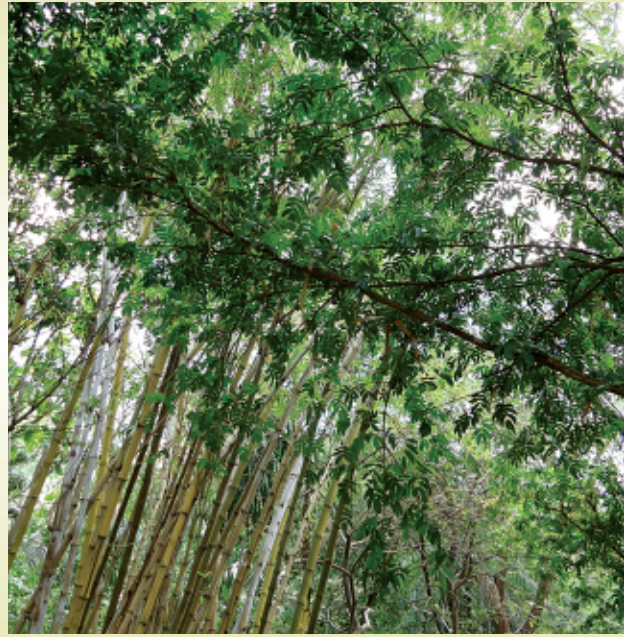


States with visas from Somoza—refused to leave his country and the flora he loved, both with the heart of a poet and the astute mind of a researcher. Ten years later he was granted the Ramírez Goyena Medal, the highest honor for a scientist in Nicaragua, by President Daniel Ortega. Today he also carries the popular title of “Father of the Nicaraguan Environmental Movement.” Through all these ups and downs, he has remained politically neutral, reserving his passions for the forests of his homeland and his vision of creating a national arboretum. This vision was realized in 1991, when Arboretum Nacional Juan Bautistas Salas Estrada was opened.

But arboreta are not built by visions alone. So when it came time to start planting, Salas was there... shovel in hand. But it wasn't a native tree that he first planted; it was the neem tree (*Azadirachta indica*) from the Indian subcontinent that he planted among the rubble still left from an earthquake that had ravaged

the city in 1972. As I toured the arboretum with Professors Maria Ruth Carénas and Karla Patricia Delgado, and my partner and translator Michael Boudreaux, it was not hard for me to imagine the trees as a living memorial to the more than 5000 victims of the earthquake, many of whom were never found. The fast-growing neem created a shady enclave in which young native trees could be planted and protected in the harsh and dry urban environment. Though the neem trees have since been removed, seedlings still sprout up everywhere under the canopy of 20-year-old natives.

The park—designed with intersecting axial paths like a medieval Spanish garden—is divided into quarters (each representing one of the bioregions of the country), with the national tree, the endangered madroño (*Calycophyllum candidissimum*), at the center. When the two educators began our tour, I realized that I was not only getting a tour of the park and its collection of trees but also a tour of the country in



LEFT: Frequently-grown *Bambusa vulgaris* 'Vittata' is used extensively for construction.

RIGHT: The evergreen lidnum-vitae, *Guaiacum sanctum*.

microcosm. We began with the north-central bioregion of the country. This region is characterized by a mass of tangled ancient mountains and many extinct and eroded volcanos, with deep wet valleys and cloud-covered peaks. Rainfall can be from 40 to 80 inches a year, and on some of the higher peaks temperatures can drop as low as 40 degrees. It is a region that still has many representatives of the ancient temperate forests that moved southward during glacial and interglacial periods. The genus *Pinus* finds its southernmost distribution in these mountains, and remnant and endangered populations of sweet gum (*Liquidambar styraciflua*) grow at high elevations, along with other common genera of the north like *Quercus*, *Alnus* and *Carpinus*. One tree found throughout the neotropics, but which is very common in the wet valleys of this region, is jñocuabo (*Bursera simaruba*)—known as the tourist tree, due to its thin, peeling, red bark that looks like a tourist's sunburnt skin. It is frequently seen as

a living fence post in coastal areas, where it is used as a wind block for crops and cattle.

The Pacific region was the second region on our tour. Since most of the rains and winds originate in the east, over the warm Caribbean, this vast, low-elevation plain in the rain shadow of the central mountains is the driest region. It is also the most densely inhabited region of Nicaragua, with greatly disturbed ecosystems. When Christopher Columbus arrived on the east coast of Nicaragua in 1502, there was a large population of Amerindians on the Pacific plains who were already modifying the natural environment. As the Spaniards decimated these great populations, the forests returned for a short period—until Spanish colonization grew, and once again the forests were felled for construction lumber and firewood, and to create pastures for the newly introduced cattle. Today this zone—a vast hilly plain with a backdrop of 25 volcanos, some crowned with cloud forest and seven still active—receives only 28 to 60



LEFT: The scarred trunk of Panama rubber tree, *Castilla elastica*, in Chocoyero Nature Preserve in the Sierras de Mangua outside Managua.

RIGHT: Bark of Madroño, *Calycophyllum candidissimum*, the national tree at the center of the arboretum.

inches of rain a year, most of which falls from March to October. The flora is dominated by grasses and forbs that have colonized deforested or burned lands. Many naturally reforested areas in this zone are dominated by introduced species in a matrix of reduced natives. In the arboretum, guayacán (*Guaiacum sanctum*), or lignum-vitae, is one of the prized specimens representing this region. Harvested to near extinction for its hard, dense wood, it is now listed as endangered in most of its range, which includes southern Florida. As one of the few trees of the Pacific slope that remains evergreen and has beautiful, blue flowers, it is a frequently planted ornamental, but is found less and less in the wild.

We moved from the driest region to the largest and the wettest—the Atlantic region—in a few steps. It has no marked dry season like the Pacific slope. This plain is relatively new, geologically speaking, and formed by erosion

on the central mountains. It is crossed by numerous, wide, voluminous rivers, which form large, swampy deltas where they meet the Caribbean. Except for one small, pine-covered, sandy zone in the Northeast, this region is true tropical rainforest with tall, straight-trunked trees covered in lianas and epiphytes. It is also home to the 3.45 million-acre Bosawás Biosphere Reserve, the largest bioreserve in Central America. You can still find there the once abundant caoba (*Swietenia macrophylla*), the highly prized mahogany, represented by a small lone specimen in the arboretum. Strangely this species, endangered in its native habitat, has become dangerously invasive in the Philippines and Sri Lanka.

Our official tour ended with the Central region, the transition zone between the other three regions. It is the region in which Managua is situated and is drier than the two tropical zones, yet wetter than the Pacific zone.

Dominated by the Sierras de Managua to the west, the Central region is a major coffee-growing region, with poor and rocky soils and scrubby native trees. One particularly interesting tree in the arboretum from that region is jícaro (*Crescentia cujete*), the calabash tree. It was the only tree flowering in the park when we were there at the end of the winter dry season. Its odd flowers, springing from the trunk, have a foul smell and attract bats as pollinators. The large, woody fruits—excrecent swellings of the wood—are used for making decorative items, and the high-in-protein seeds are ground and added to the traditional Latin American drink horchata. Its adaptability to dry soils and use as a fodder for cattle has increased interest in this often overlooked tree. Another important tree native to this region is palo de hule (*Castilla elastica*), or the Panama rubber tree, milked since Pre-Columbian times for its rubber-producing sap and used today for making balls.

Beyond being a center for education and a beautiful bit of shade at the heart of the city, the arboretum produces large quantities of saplings for local reforestation projects. Hundreds of trees, started from seed each year in the arboretum's open air "greenhouse," are planted at schools and parks throughout the region. Some useful non-native plants, like common bamboo (*Bambusa vulgaris* 'Vittata'), pineapple (*Ananas comosus*) and guava (*Psidium guajava*) are also growing in these nursery gardens surrounding the offices and visitor center. The love in which this arboretum is held is evident in the high level of staffing. Besides professors Carénas and Delgado, who lead tours and teach classes, there are three gardeners and two guards, all under the direction of director Roberto Domínguez Hernández of INAFOR. Salas' creation has also inspired the poetic side of Professor Delgado, who wrote the official song of the arboretum. In



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The Arboretum Nacional Juan Batistas Salas Estrada: An urban oasis.

“Cancion Arboreto Nacional” her sweet voice entices visitors to enjoy the arboretum and thanks Salas for leaving them “a little green forest.”

Though our visit to the arboretum was a brief two hours, it ended up being an important introduction to a flora and a country we would be seeing for the first time. While we travelled on through rainforests, cloud forests and coffee plantations, and lounged on coconut palm-covered beaches, the New Zealanders in Christchurch were still searching the rubble of their earthquake for survivors, the Egyptian revolutionaries had ousted their despot, and the earthquake and subsequent tidal wave hit Japan. There were tremors moving through the Nicaraguans, too, as they remembered the horrors and travails of their own revolution and earthquakes. But I couldn't help but notice the

joy in their faces at having these hard times behind them, as if they were listening to the kind words of Salas when he said in his later years, “I have nothing against anyone, against anything that happened. I can be peaceful any place, without worry and that is a great sustenance in life.” This man has inspired a young generation of environmentally conscious Nicaraguans with his fatherly words and his peaceful arboretum, as they reforest their country one tree at a time. ∞

DANIEL MOUNT received a BSLS - Botany degree from the University of Wisconsin - Milwaukee. He currently works as an estate gardener in the Seattle area. Read his thoughts on gardening on his blog, danielmountgarden.blogspot.com.