

Design

The Botanical Garden of the Future

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Opening day has arrived for this future botanical garden! Welcoming statements are released to a press anxious to get the scoop. Television and radio stand by, ready to go live. Donors arrive for the dedication, visitors pour in the gates, developers rush to the new demonstration environments, local politicians call, eager to lend their name. This new garden is an integral part of a new society; it is treasured as an important wellspring of knowledge. It is the preeminent institution for directing policy on environmental health. Its direction is forward, and its time is coming.

This new garden is not the source garden of the monks of the Middle Ages; it is not the study garden of the Linnaean scholars. It is not the pleasure garden of the Victorian era. We are nearing the end of the reign of the pleasure garden and approaching a new era, the ecological garden.

My horticulture education was at the National Botanic Garden in Dublin which,

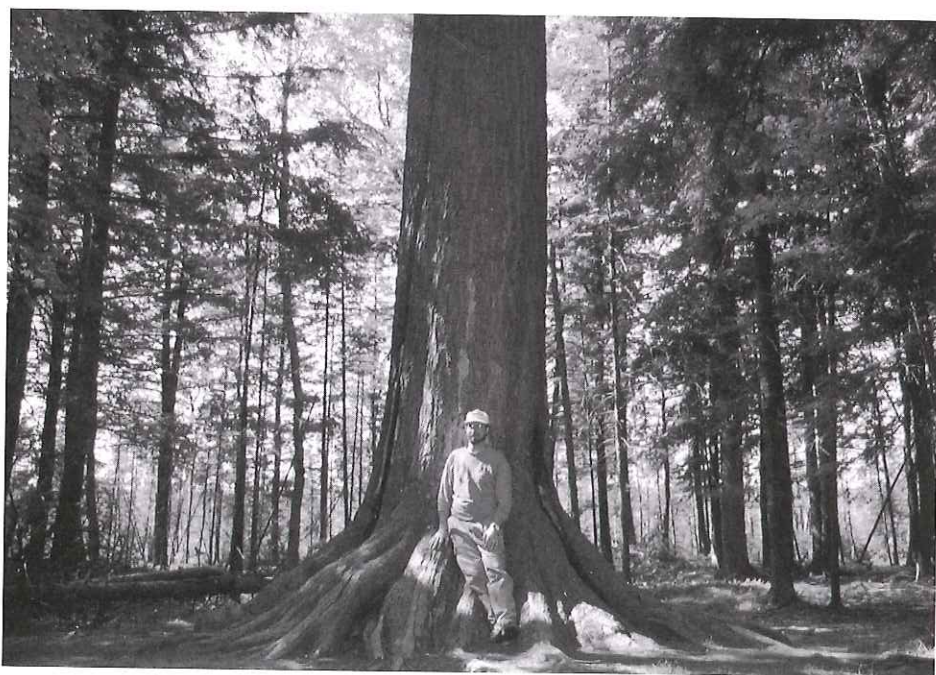
by virtue of its age and location in Europe, passed through and encompassed all the major phases in the development of botanical gardens: the source garden, the study garden and the pleasure garden. Included were spectacular Crystal Palace-era greenhouses, Jekyll-inspired perennial borders, enormous orchid collection, walled orchards and vegetable garden, entrance garden organized solely by family, Grecian-style folly, hand-dug lake, and an Irish native plants garden, all within nearly 50 acres. Yet, still found within the sleepy cloistered walls of the National Botanic Garden in Dublin was a former reputation, when plants were known more for their pharmaceutical value, their physical properties for building and their food value. It seemed perfectly acceptable that the ghosts of all these disparate approaches to the use of plants walked hand in hand within my fondly remembered "Bots." I also remember knowing, however, that this place had more importance to Ireland than the public perception that it was "only" a place of peaceful beauty.

For more than 200 years plants have been largely viewed by the public as a green filler, a form of exterior decoration, with the key components being a veneer of color, texture and shape. My personal view of plants has changed radically in 20 years. When I see ecology and beauty combined, I am inspired. I now see plants primarily in terms of their ecological value with amount of water consumption, native origin and value to wildlife as the new key components. I still consider a plant's aesthetic, pharmaceutical, physical properties and food value, but, as with all re-valuing, the stock of some plants has risen while others have fallen.

What does our botanical future hold?

I see waste water wetlands overflowing, not with sewage, but with brilliant cardinal flower, swamp milkweed and great blue lobellia. These plants take waste, profit by it and return oxygen for me to breathe and beauty for my spirit, with the faint scent, not of pollution, but of pollen. Detention and retention basins evolve from turf tubs into giant living vases of sweet flag, arrow arum, potamegeton; they hold water and put the fat back into the land. That generous swath of wetlands and prairie potholes that swept through the heart of this continent before they were destroyed is now replaced and called storm water wetlands. Living retention basins sustain flocks of mergansers, cranes and herons in numbers that take the breath away. There they are, I see them now, complete with binocular station, duck-viewing blind and recycled plastic deck, a place where developers might sit and ponder another way to proceed.

I look out my office window to the future and see a parking lot island intercepting storm water runoff and producing swamp white oaks of such girth and height with such speed, that tree lovers marvel. They wonder, "Why was I taught that oaks are obsolete slow growing relics not worthy of planting?" The oak, the genus king east of the Rockies, this most generous of plants that supports more wildlife (per plant) than any other in North America, takes a leading role in tree plantings. No longer



The MacArthur Pine in Rhinelander, WI, is the tallest *Pinus strobus* in the United States.

reduced to bit player roles, tree and shrub screens on the edge of service roads and parking lots are now populated by pawpaw, persimmon, cut-leaf elder and American hazel. When the fruits and nuts produced fall to the ground, they are not treated as "yard mess" but rest gently in the mulch bed below waiting their collection by the wildlife that would not survive without them.

I see botanical garden stream banks fortified with living armor rather than mile upon mile of dead concrete. For millions of years, river and hard stem bulrush and sandbar willow have colonized water edges as they begin the long slow process of building soil horizons. Crews now labor to replace thousands of tons of rip-rap rock with these hardy plants. Vegeterraces of prairie cord grass and switchgrass send their massive roots to the water table holding soils in place. Cultivars of the hundreds of North American mesic plants found in the mid-range between hydric and xeric soils having been sent to "botanical garden finishing school" are now garden-catalog ready and bulldog tough. Splendid colored blooms with roots that build soil more effectively than an army of double-digging manure amending gardeners thrive in new gardens. These new cultivars of ancient plants are recharging groundwater. We now are working to recreate a time when a drop of water took decades, centuries, millennia to reach oceans, a time when half of ocean level rise was not from continental dewatering. We are now holding and filtering our water, keeping it in our regional water tables and valuing it. The war against kudzu and purple loosestrife, buckthorn and eucalyptus has been won. Rampaging alien plant invaders no longer sweep the locals aside, no longer disrupt the water table, their shallow roots no longer allowing the soil, our soil, to be swept away in heavy rains. Topsoil is once again measured in yards.

I see citizens, instructed by this botanical garden, cultivating trees and adding homes for wildlife knowing that the cavity dwellers are lost without giant trees in the landscape. Gardeners build small backyard brush piles near their bird feeding stations. Animal police are on patrol—bats, purple martins, lacewings, nematodes, all carrying

out their mission to balance the backyard. Everyone is busy covering the root area of anything green with wood chips. The lawnmower has shrunk, lost its status, become a small garden tool. Biological pest controls such as *Baccillus thuringiensis* are applied to insure that we inhabit a busy living place not a dead pesticide poisoned landscape. Snakes are welcomed, snug in their own boy scout built terrariums. Neighbors band together to build fish shelters for their local lakes and rivers, regrooving the habitat niches, sharpening the landscape's habitability for all species.

In my future backyard, I sit on a recycled plastic bench, beside the perennial bed planted in soil comprised of fly ash recharged by composted sludge. My more water sensitive exotic plants are irrigated by gray water oozing up from subsurface pipes made from recycled rubber tires. My feet rest on the crushed concrete path, and I can hear the warblers as they congregate to gorge on the insect flush that will power them on their return trip to the tropics.

And what do I find at that phenomenal new botanical garden that has just opened? This botanical garden marries style with the plants of its region. In this botanical garden of the future, French formal is bounded by black maple, English cottage perennial borders includes eye popping coreopsis and beebalm, Elizabethan knot gardens sprout hedges of lead plant and obedient plant. As I line up with thousands to take the first tour, I find exhibits on the restoration of the native plant communities on site, with infant oak savannas and woodland spring ephemeral gardens. I stop for the cultivar experiments, developing plants to serve as alternatives to overplanted species. I pass the insect expert demonstrating how to raise native bees, moths and butterflies. I visit the preserves stewardship network where I meet the coordinators who take knowledge out into the community. I find the pollution busters' water gardens where filtered pollutants are identified and measured for all to see. I rest by the side of the created wetland; I watch the dragonflies below and the hawks above.

Conclusion

As the ecological value of plants asserts itself over time, I see botanical gardens and arboreta first incorporating these values on the edges, then emphasizing them in the center of the collections, then placing them at the entries. As my beloved "Bots" did before with the source, study and pleasure gardens, over time, the ecological garden will be enfolded. In time botanical gardens and arboreta will tie together all the ecological strands into one coherent whole. Models, practices and demonstrations will link plants to their ecosystems, placing the stars in their constellation. As the ecological requirements of plants and plant communities are so diverse, no two institutions will look the same although bio-regionally there will be strong synergies. As every person has one compelling story (their own), every landscape type has its own compelling story, its ecological story of that place. My ears long to hear those stories told in the botanical garden of the future.

President of the Kestrel Design Group, Inc., Peter MacDonagh is a licensed landscape architect, certified horticulturist, certified arborist, trained wetland delineator and certified wildfire burn manager. The Kestrel Design Group's specialty includes natural areas restoration, urban forest preservation, wetland, rivers and lake rehabilitation and specialty gardens for botanical gardens, parks, zoos, nature centers, schools, and corporations. Recent projects include a seepfen created from abandoned farm drain tile for a 100 acre natural restoration at Peck Farm Park in Geneva, a large perennial garden at the center of Brookfield Zoo and a dinosaur garden for Crow Island School, all in greater Chicago; botanical master plans for Mesker Park Zoo and Botanic Garden in Evansville, Indiana, and one for the Simon Bolivar Zoo and Botanic Garden in Costa Rica. The firm is committed to practicing state of the science restoration ecology and bio-engineering; teaching responsible human intervention in the ongoing care of the natural world, and; creating meaningful connections between people and natural places.