



**Nectandra Institute**

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## A Gardener in Paradise and Enlightenment

“Rain forest of Costa Rica is heaven, but its cloud forest is paradise.” This was what my associate Arturo Jarquin revealed in moments of reflection while we were walking through Monteverde Reserve on my visit to Costa Rica. I wanted to ask him to elaborate, but the story of the Buddhist novice in training for monkhood popped into my mind at that very moment. As the story goes, the novice spent months dutifully chanting the memorized Sutra many hours a day, day after day. He performed cheerfully all the daily but somewhat menial tasks required of him. He sacrificed personal pleasures and family comfort willingly for the spartan monastery quarters and disciplined lifestyle, all in exchange for lessons on how to reach Enlightenment, an exalted state of mind and living. Months and then years went by, but the lessons never came. He is now older, still doing the same daily chores and no wiser than the youth that first arrived. Finally, frustrated, he asked the abbot for an explanation. The aged abbot listened, then quietly and patiently replied “Brother, when you reach Enlightenment, you will know it. That is the lesson”. Mindful of the above story, I refrained from asking Arturo about heaven and paradise. A year later, I had the opportunity to seek the answers for myself, living and working in a Costa Rican cloud forest.

Arturo is the Nectandra project manager and chief gardener from inception. Starting with our former garden designer Sigi Altamirano’s preliminary vision for the garden, Arturo has expanded, refined and polished it. In the last four years I have watched the daily transformation of the little mud hole and surrounding patch of abandoned pasture as it turned into an exquisite jewel of a pond, set in ancient volcanic stones quarried from nearby Zarcero, bathed by waterfalls. Best of all, it is ringed by the crowning cloud forest provided by Nature. From this jewel now radiates five halos of inviting and comfortable trails, each taking the visitors deeper into our forest in the clouds and hopefully, deeper into their awareness that Paradise is not well and in need of help.

Needless to say, the transformation came at a price. To minimize the negative impact on the forest, tree cutting was

kept to an absolute minimum. Heavy soil moving equipment could not be used because of the narrow paths and even if it were feasible, it would have caused extensive soil disturbance. That meant the garden crewmen, all seven of them describable as “petit”, had to shovel and shift an estimated 5000 cubic meters of dirt, a volume 30 x 30 x 5.5 meters or 100 x 100 x 17 ft, one wheelbarrowful at a time. It meant that the 100 or so truckloads (5 cubic meter each) of material delivered by the entrance, of beachball and fist-sized rocks, of paving stones and cement drainage troughs, of gravel and sand, all had to be transported around the garden and up the higher trails by any means feasible. I watched as Arturo and Luis Perez, his assistant gardener, and the garden crew struggled and grunted for days with ropes and metal bars, moving huge boulders in deep mud to their final resting positions. The mud was sometime so soft and so deep that even I, a featherweight, sank in about 10 inches. It meant that for each kilometer of trail built, the men must have walked it a hundred times with the sacks of material on their shoulders. It meant that the effects of an annual average of 300 cm (120 in) rain have to be dealt with. Ditches and drainage channels had to be installed, terrain had to be graded, hillsides had to be stabilized, retaining walls built, bridges to take foot traffic across streams, not to mention the continuous maintenance of the trails already built, the daily care of the tools, of insect bites and weary bones, and most of all, the countless boot washing sessions per day. With so many days of rain in a year, it would be unthinkable to stop work because of rain, so work goes on, rain or shine.

Arturo’s love for plants has taken him to the US as horticultural apprentice, for one year at The Longwood Garden in Delaware and another year at the Missouri Botanical Garden in St. Louis. His year at Longwood introduced him to gardening in the European formal tradition: exuberant seasonal colors, formal green hedges and clean contours. In Missouri, he felt at home working in the Japanese garden and equally in the world class herbarium studying botany and plant taxonomy. This training provided him with a lasting horticultural foundation but it was his many years as a naturalist guide walking through the Costa Rican cloud forests that primed him for our project.

In the time that we have worked together, I have learned many invaluable lessons from Arturo about gardening and how to create a unique type of garden in the cloud forest. Our many informal planning sessions for the Nectandra Garden often start with our mission statement, which is to educate and inform the public about cloud forests. Invariably, they turned into discussions about differences between gardening in the temperate zones and in our cloud forest. I was quite startled to realize the extent of changes in mental approaches required to bring the Nectandra Garden to fruition. You may find the following summary of our combined observations interesting.

The modern garden is a landscaped place where man can grow and display plants, flowers or objects of his interest. The limited range of plants he uses are now most commonly hybrids, purchased from large, international commercial growers. These plants decorate the open space much the same way as objects are arranged in the interior of a house, tidily and in appealing geometric patterns. The designer often starts with a two dimensional, clean piece of paper on which to place what pleases him. To execute this plan, he often does the same in the field; the ground is leveled and cleared as indicated on paper; the selected plants at the desired stage of maturity are put in the wanted form and shape. The modern gardener's enemies are primarily pests which he can control chemically to a large extent. Acts of nature are inconveniences, but they happen infrequently enough that he can either plan for them or ignore them. He often expects to be able to "maintain" the garden in the same conformation, often necessitating elaborate sprinkler systems, frequent pruning, thinning, plant replacement and aggressive weeding programs. When this is carried out to extremes in American urban settings, we have large corporate commercial garden firms come in, level the spot, spray it with herbicide, wait a few weeks, put in a new carpet of sodded lawn, plus a few plants in peak flowers selected by colors, a few shrubs with one of the three correct shapes (bushy, lollipop or erect) chosen by the landscape architects and we have an instant



new garden. When the lawn looks tired and the plants unruly or no longer yield colorful flowers, the whole process is repeated for a new garden.

This approach would have been ludicrous in our cloud forest. To begin with, the forest is nothing but flora and fauna, of unimaginable variety and luxuriance, where every plant part is a growing surface for other life forms. No other surface on earth can compete with the tropical cloud forest in biodiversity. To level it to make space to grow and display plants from the cloud forest would be sheer insanity. (Yet, this is what our neighbors are doing with their monocultural plantations of ornamentals from the cloud forest, grown for export).

Our dilemma stems from excessive richness . To paraphrase Adrian Forsythe and Ken Miyata in their book *Tropical Nature*, "It is one of the ironies of the cloud forest that rare species are common but common species are rare." This enormous diversity of flora overwhelms the visitor's sense of order and aesthetics. In short, it is a case of too many, too heterogeneous, hard to recognize, can't appreciate. How to solve this dilemma? We solved it by saving and using every plant we touched. Plants removed to make trails were sorted and grouped by species. Arturo and Luis would select those



suitable for the “designed” part of the forest along the 3 kilometers of trails; the rest are replanted and spread back in the forest - conservation, propagation and reforestation all in one stroke. Against the heterogeneous background, the grouping of objects has the effect of focusing the visitor’s attention. Grouped plants will also be easier for the placement of plant signs.

On top of Arturo’s list of criteria for selection of horticulturally interesting plants are foliage textures and foliage colors. He uses them to provide visual contrast, and to compensate for the lack of massive colors from flowers. Westerners are acculturated to expect colors *en masse* in gardens and even in the wild. This is rarely seen in the cloud forest. Inflorescences of plants with colorful flowers tend to flower asynchronously, putting out one or two flowers daily for a long time to increase its chance of getting pollinated (or perfectly photographed! I had 10 chances with a magnificent flowering *Costus laevis*, but discovered a fierce competitor in the yellow and black weevil, *Cholus cinctus*, that beat me to drilling the fresh flowers for 7 days in a row. (See opposite photographs).

In California where Nature is extremely kind to gardeners, three infrequent events interfere with perfect gardening: a long drought, frost, and infestations by insects or microorganisms. The first two occur about once a decade, the latter is controllable with a spectrum of chemicals. It is easy for the gardener to pretend he is in charge of the environment. In the cloud forest, it is obvious who is not in charge. (Witness the ease by which the mosquitoes, ants or even tinier biting insects can make the human visitors drop their expensive cameras/binoculars and you would agree with me). Without chemical armament, we gardeners have no defense against the tiny leaf cutter ants, nor the waves of famished caterpillars and beetles, or the marauding capuchin monkeys that covet the fresh bracts of tree ferns (long awaited by the humans who transplanted it). Life under the tree canopy is much more democratic. The competition is fierce for all things, for light, space, air, nutrients and most of all, for water from rain and clouds. For all the fauna in the forest, it is rare to find a carcass of any kind, whether of insects or of higher animals. Dead meat, cellulose, metal, acrylic paint, all is consumed and degraded rapidly. The most noticeable indicator of the high turnover is the rate of falling trees. Rarely a week goes by without our having to remove mature trees from the trails somewhere in the garden. Rarely does a day go by without our having to clean after showers of moisture-saturated branches, large and small, laden with epiphytes and living creatures.

The third dimension is the most distinct feature of the cloud forest. Every plant is an ecosystem unto itself. Mosses, lichens, ferns, orchids, bromeliads, lianas and hundreds of epiphytic species coexist in tangled masses, on the tree trunks and every part of the plants. Our knowledge of the luxuriant growth on top of the canopy is often restricted to

mere glimpses, as broken branches on the ground. On those rare occasions that we actually witnessed a falling tree, the profusion of living creatures scattering from the trunk was astounding - snakes, anoles, birds, moths, beetles, other insects. These are very much a part of the garden as well. Without them, there will be no cloud forest garden.

In the tradition of western gardens, forest and gardens are not one but two entities. Forest may be part of a garden, but no one would mistake the forest to be the garden. Isn’t the term cloud forest garden a misnomer? Come for a visit. You will see that it is not a contradiction in terms. It is indeed a garden—irreplaceable, endangered, shrinking—but still a wonder of a garden. Nature provides the setting and material; we merely rearranged it, just slightly. When walking through the cloud forest, one cannot help but feel awakened and humbled by the glory of Nature —perhaps even enlightened. For the prepared mind, it is the best last place to witness the celebration of life. Is it Paradise? For the inhabitants, undoubtedly. Ask the quetzals stopping for sustenance on the way home; ask the sloths basking in the mist at home.

We humans must not let it become Paradise Lost.

—Evelyne T. Lennette

## Progress Report

The New Year marks the end of a four-year “eclipse” period of the Nectandra Project, when the foundation and the infrastructure of our organization were being established. I am happy to report that we are now ready to leap ahead and work on our main objectives. Nectandra Garden will be opened to the public soon after the New Year.

This has been an exceptionally rough year with all the problems associated with the construction of the visitor center, but we survived it in good spirit with a long list of accomplishments. Many of the following activities will be detailed in future newsletters.

For the public:

- <http://homepage.mac.com/NectandraInst> is our website. Please visit it for current postings and past issues of our Newsletters
- Construction of the Visitor Center is reaching completion. Our new home will have a cluster of 4 small modular buildings (Conference/Classroom, Science gallery, Art Gallery and Café) and one separate Reception center. Most of the buildings were designed with very large windows and clear roofing to show off the forest canopy.



*Construction of the café in July 2003*



*Stone trail on a rare sunny day*

- The Garden, as a destination for ecotourists, will become a nucleus for public education on the ecology of cloud forest and its biodiversity. If everything goes according to plan, it will also provide income for our future educational and research efforts.

- About 3 kilometers of trails have been built, 0.5 km of which are stone paths suitable for wheel chairs. Informative signs to identify the horticulturally or medicinally important plants along these trails will be placed in the coming weeks.

For our research goals:

- The preliminary survey of the reserve is continuing. We now have a qualitative description of the general conditions of the forest, its terrain, and how it may have been altered by recent human activities.

- We have completed a quantitative tree inventory of 30 parcels, each 10m x 20m, distributed over the 100-hectare property. Trees of 10cm or greater diameter were identified and tagged. We hope that analysis of this survey will give us a clearer idea of the state and diversity of the forest. Long-term monitoring of the tagged trees will yield more information about the individual species and their associated ecology.

- We continued with the bird list.

- Our herbarium collection of endemic plants has now increased to over 750 specimens, almost all of them identified down to species. The remaining few are in the hands of specialists for final identification. Duplicate specimens of the many unusual plants were submitted to the herbarium at the Instituto Nacional de Biodiversidad (INBIO). Each specimen was photographed digitally before it was dried and mounted onto sheets. The photographs and all other information/observations associated with each specimen are being entered into a computerized data base. Users of the herbarium will be able to “view” specimens digitally to minimize handling of the delicate dry specimens.

- Reforestation efforts have begun on two large parcels (about 2 hectares each) on the southern boundary of the forest. Over 1000 seedlings of selected species from 20 families were collected along the edge of the forest and transplanted to nearby pastures and cleared fields. The tagged seedlings will be monitored for growth and development.

- A full-time forest ranger has been hired to do daily rounds, to record and monitor general animal activities, and to patrol for illegal activities. We have been very encouraged by the noted increases in animal activities (identified and recorded by density of footprints) during the 10 months since he started his work.

# Nectandra Institute

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*Our mission is to promote, through public education, the conservation, restoration, and sustainable use of the montane cloud forests of Costa Rica*