

FEELING AT HOME IN PARADISE—NATURALLY

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~~if one way is better than another, that is surely nature's way~~

Aristotle

Somehow you just know when you're about to get busted. Its that horrible feeling that rises in your gut just before your mom walks into the room or when the idiot in the back seat turns around after the driver says "nobody look, there's a cop following us." Even though I felt it, I had to do it. I lit the match and watched, waiting.

The smoke from my cigarette did just what it was supposed to do. The cloud moved up at an angle, following a barely perceptible current of air from low vents under the windows towards a high vent over the open stairwell. The thing works, I thought as I stubbed out the incriminating evidence and waited to be caught red-handed

I was in the inner sanctum, the conference room and library, of the Instituto para Arquitectura Tropical in San Jose. I didn't even start to peruse the library of several thousand volumes on every possible subject. They remained temptingly untouched in their shelves. Architect Bruno Stagno, the Institute's founder, had agreed to meet me after a brief phone conversation persuaded him that I was sincere in my interest in trying to bring some eco-logic into the building boom in Guanacaste. Fortunately, as a child I had read a lot of Sherlock Holmes, I clicked into observation mode.

The diplomas on the wall included one from the prestigious *Ecole des Beaux Arts* in Paris. Cool, I thought, I'll greet him in French. The place was tasteful, simple and elegant. A low-maintenance façade of concrete block with red brick opened up to a tastefully done interior of light colored wood, teal-green tile and ironwork.

His articles in *La Nación* had drawn my attention with the mention of energy savings in buildings of up to %80. Great, I thought, having just read that the future power generation capacity of ICE was in doubt due to cancellation of a dam project for environmental reasons. Mr. Stagno's own books show airy designs and an interest in the buildings of indigenous peoples. You figure that if a culture lived in an area for a thousand years or so, the natives probably had the sense to minimize inputs—less silicone, duct tape and concrete—and maximize comfort. That was easy to appreciate. My mentors in agro-ecology often look at how the locals farmed for centuries. The bottom line, if they are still in business—unlike the Egyptians and scores of other cultures—they got something right. The same principles hold true for building.

I sauntered around the room a bit, still worried about the lingering fragrance of my previous misdeeds. The air movement which covered my tracks was coming from a grillwork in the wall facing the street. "No-duh," as the kids say, was my only thought. The sloped exterior overhangs sheltering lower floor windows from sun and rain at the same time provide low air intakes for the second and third floors. The principle was

familiar:cooler air comes in low and warm air goes out high, the temperature difference and proper sizing and location of the vents gives you an energy efficient cooling system.

The efficiency of natural ventilation is even greater if you are not trying to pump out all the heat which you pumped in with your original design. Rule number one for tropical architecture: *Don't let the sun hit an exterior masonry wall.* The ultraviolet rays of incoming sunlight pump heat into the wall from the outside, it passes through and re-radiates as infrared radiation on the inside. I learned this the hard way in Sibolga, a steamy port city on Sumatra, recently the center of rescue efforts in the wake of the Indian Ocean tsunami.

The grimy penthouse apartment was well ventilated and refreshingly cool—until I closed the doors to keep out the mosquitoes. I woke up dead certain that I had come down with malaria. Covered in sweat from head to toe it dawned on me that I had gone to sleep next to a wall that had been completely exposed to the wrath of the afternoon sun at 4 degrees north latitude. The rules of physics are just like the laws of the land—ignorance is no defense. The infra-red radiation was cooking me just like any other piece of meat.

Now there is no question that you can overwhelm, suck out and throw away the one to two kilowatts per square meter per day which may be accumulating in, passing through and re-radiating from exposed walls. Panasonic sells a nifty unit for \$1500 installed that will conveniently remove and dispose of 5 kilowatts per hour from a relatively spacious bedroom. However, the downside is you are also paying for the energy to run the unit. According to Coopeguanacaste that will run you about \$350 per year for 8 hours daily. Maintenance, spare parts and replacement costs should also be considered, the energy costs are going nowhere but up, and in the unfortunate event that the future power needs of this country are not met—as currently predicted in the national press—you might as well be sleeping in that solar oven in Sibolga.

It is precisely by combining elements of design, avoiding heat build up, inducing currents of air, etc. that bioclimatic architecture, as practised by Mr. Stagno, seeks to resolve the challenges of tropical building design. The %80 reduction in energy consumption mentioned in an article in La Nación, comes from the synergy of a host of techniques working together.

Given my interest in water conservation and reuse, I am currently adding a wetland system with native plants to purify shower water directly upwind from a low vent in the kitchen. The idea is to lower the temperature, raise the humidity and have a natural versión of what they called “swamp coolers” back in Arizona.

On the back side of the house I am constructing a cylindrical tower of rocks, made out of a recycled gabion. This will project up to the second floor deck where an outdoor shower will filter down, through and around the rocks planted with orchids and ferns. The wind whipping around this structure, will be cooled, humidified and vented up and through the master bedroom—out through a pop up vent. My philosophy is try it out on

myself first, before recommending it to others. Unfortunately the medical profesión doesn't try this approach.

Footsteps on the stairs alerted me to my imminent rendezvous with destiny. Bruno Stagno entered the room and took my hand warmly as we exchanged greetings in French. Frankly, I was taken aback. He seemed like a neatly dressed artist/intellectual type, hardly the ogre I had been led to believe. At least two other architects had told me that he was an arrogant know-it-all. I had almost given up the idea of asking him to participate in an upcoming course, but I decided, what the heck, might as well see what he's like. Thank god. We had a wide ranging discussion about building, architecture and the environmental problems of both Costa Rica and the planet as a whole. A lapse in the exchange provided an opportunity to tell him that I had been warned away by two of his colleagues. His answer was ominously metaphorical.

“ I am not interested in the precise arrangement of deck chairs on the Titanic.” Honestly, literary nuances are normally not my strong point, but I caught his drift. Among other things, Mr. Stagno feels that architecture has a pivotal role to play in providing sustainable solutions to environmental problems—both locally and globally.

Let's say you are planning to build a home, develop or invest in a project right here in Guanacaste. You decide if the synopsis outlined below makes sense.

Global warming is a fact. You know that when it moves from Greenpeace magazine to a full issue of National Geographic and hush-hush studies by the Defense Department. Climate change is brought about by a number of things but in large part due to the overuse of fossil fuels. With the planet warming—2005 predicted to be the hottest year in two centuries-- plus the instability and the uncertainty of world petroleum reserves and the future squeeze on Costa Rica's own hydro-generating capacity, energy saving in buildings makes sense. Add to that that natural ventilation is healthier, saves money and developers can proclaim to be ecologically aware and jack up their prices.

Fact: Guanacaste has a water problem. Even the golfers know that, because one golf course has taken to using ocean water mixed in with fresh. The previous 'solution' was apparently a bit offensive to occasional ball-licker on the putting greens. Doesn't it make sense to purify waste water in a “green zone” instead of percolating it into already aquifers? The fecal coliform bacteria in Tamarindo's water supply just doesn't seem likely to have a long term positive effect on land values.

Fact: The Nicoya Peninsula is one of the most seismically active regions in the world. Japan, the world leader in earthquake preparedness and seismic engineering for buildings, took a terrible hit as a result of the disastrous Kobe earthquake. The 1994 earthquake in Los Angeles was the worst natural disaster ever to affect the US. According to one study, the seismic event caused vast structural damage precisely because “structural steel did not perform as well as anticipated...nobody anticipated that steel would fail at the rate that it did.” With all due respect to the designers, engineers and builders who are doing their best to ensure that all that concrete will stay put if and when

the shaking starts, wouldn't many homeowners sleep more soundly in a "light, airy" well braced and flexible structure?

I'll let Mr. Stagno agree, disagree or revise and amplify upon my overview of the challenges and possibilities of building in our region. I didn't find him arrogant. I found him in an elegant, smoke-free environment. And I promptly invited him to participate in a course on "green" home and landscape design in Guanacaste. He accepted, rather enthusiastically, it seemed. In retrospect, my French probably helped, not to mention the absence of any nasty odors.

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