



## Wall of wonder, wall of life

There's a bit of mystery as to why the breathing wall works so well at the new Canada Life Assurance building at Simcoe and Queen Sts. in downtown Toronto.

Designed as a tropical ecosystem in miniature, it meanders about 30 metres along the walls of a conference room at street level, and delivers air to the room that has the heavy, sweet caress that Canadians would associate with a winter visit to Trinidad.

The surprising thing, says its creator Wolfgang Amelung, is that "you can fill the room with people, 60 or more, and the carbon dioxide levels soar. And then, all of a sudden, they plummet right back to where they originally were. It astounds plant biologists, who say there's no way the plants can convert that much CO<sub>2</sub>."

Amelung is a biologist and president of Genetron Systems Inc., which designs similar systems for providing fresh air in homes and for cleaning water in swimming pools without the use of chemicals.

In his mid-40s, with graying hair dropping at the back in wayward wisps to his shoulders, he seems more philosopher than scientist. He suspects that the unaccounted for CO<sub>2</sub> is being removed by what he calls "hungry water" used in the breathing wall.

But no one is sure if that is the case because the water does not show an increase in acidity, which would be normal if it were dissolving that much CO<sub>2</sub>. Scientists at the University of Guelph are studying the wall but, as yet, don't have definitive answers.

Air is drawn from the room through porous volcanic rock that stretches to the ceiling behind the plants that form the breathing wall. Water flowing gently over the rock face cleans the air as it passes through. The air is then recirculated back into the room. It is a closed system. No other air is fed into the room. The plants generate all the oxygen required.

### ABUNDANT SPECIES

And what plants! Birds of paradise ranging from a metre to three metres in size. Bamboo, tropical water lilies, rain forest cactus, azaleas, philodendrons, orchids, reeds, a black olive tree, ferns and mosses that reach and climb and hang — in all, 250 different species. And at the foot of the wall a glassed-in channel for returning the water is alive with tropical fish, frogs and snails.

When he says the water is "hungry," what Amelung means is that it is free to act on airborne gases, which include volatile organic compounds as well as CO<sub>2</sub>, because it is not encumbered with free-floating nutrients. The breathing wall ecosystem has "locked away" the nutrients so it can access them as needed to support a high degree of diversity.

This is characteristic of a high-level ecosystem, he says, adding that we still have a lot to learn about how ecosystems work. The mystery of the breathing wall is how does the water convert the CO<sub>2</sub>? What does it unlock to help in the job? And into what lockup go the results?

Whatever the answers, the ability of the room to supply good air is so well-established that Canada Life is planning to connect the circulation systems for the ground floor lobby and the first three floors of the building to the breathing-wall system.

It cost \$250,000 to install the breathing wall and another \$250,000 for the equipment to circulate the air and water that sits in a room behind it, says Kelly Sheard, director of communications for Canada Life. "What we got was something unique and attractive as well as something with a practical application."

Breathing walls work, Amelung says, because nature is respected. "Primarily we come from controlled situations. We reduce things to something we can understand, even if that something works worse.

"We need to learn to allow ourselves to be open and unbiased, to let systems show us how they organize themselves. We don't always have to be tearing them apart in an effort to understand their parts. When we start taking something apart, it doesn't exist any more. And then we can't unravel how everything works as a whole.

"Our modern, mechanical, linear minds have never consciously done this before." It's time we started, he says.

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