Appalachia's new spring

BY MOLLY WALSH, FREE PRESS STAFF WRITER • SEPTEMBER 28, 2008

As ideas go, this one is ambitious: Harness nature's built-in repair mechanisms to restore vast stretches of Appalachia ravaged by coal mining. Buy the land and seed a network of small businesses. As the landscape heals, gradually allow the land to revert to private ownership, but leave it in the hands of the many rather than the few.

This big idea belongs to John Todd, a visionary biologist and ecological designer who trots the globe and works as a research professor at the University of Vermont. His plan to restore the landscape in West Virginia and other coal-mined states won the first annual $100,000 Buckminster Fuller Institute Challenge award this year.

Todd has come a long way since the 1970s when his pioneering efforts to popularize renewable energy, organic farming, aquaculture, and natural wastewater and pollution treatments were viewed as far-out. So far-out that one of his more conventional colleagues at the Woods Hole Oceanographic Institution on Cape Cod called him a "public disaster."

From today's vantage point, Todd's early work was prescient. He was attempting to solve environmental problems that are now much more widely recognized. His writings and his innovative work in using natural processes to clean up wastewater and industrial pollution

ALISON REDLICH, Free Press

John Todd, a professor at the University of Vermont, has been recognized for a proposal to restore land spoiled by coal mining in Appalachia.

ABOUT PROFESSOR JOHN TODD
OCCUPATION: Ecological designer and research professor at the Rubenstein School of Environment and Natural Resources, University of Vermont
CO-FOUNDER: New Alchemy Institute; Ocean Arks International
RESIDENCE: Winooski and Cape Cod, Mass.
FAMILY: Wife, Nancy Jack Todd; three grown children
AWARDS: Buckminster Fuller Institute Challenge award with $100,000 prize, 2008; Hero of the Earth honoree by Time Magazine, 1999; Charles and Ann Morrow Lindbergh Award for innovation, 1998.

ental movement.

He's collected his fair share of awards, but the Buckminster Fuller award, named for the futurist and architect who made the geodesic dome famous, was particularly satisfying.

Nancy Jack Todd recalls the day the call came from the New York City-based Buckminster Fuller Institute to break the news to her husband. "I heard him chatting away in a perfectly normal manner and then all of a sudden I heard him start to gulp and stutter, which is very unlike him," she said. "And then he began to say, 'Thank you, thank you, thank you.' ... It was beyond his wildest dreams."

Todd says the award is deeply fulfilling. His idea is not one that promises overnight transformation or environmental magic of the, as he puts it, "turn algae into jet fuel in two easy classes" variety.

So he's grateful a complicated theory was recognized. Todd also values the fact that he won the award as he approaches his seventh decade. There's a tendency in academic circles to believe bold new ideas are the exclusive province of the young, he said. "And for somebody who isn't, it's very satisfying not only to remain in the game but to do it well, to have new ideas."

From 'public disaster' to visionary

Last week at the University of Vermont, Todd greeted a classroom of about 50 students. He wore a baggy sweater and displayed a congenial manner that kept the questions flowing and the conversation going.

First, he asked, did anyone have announcements to make? One student plugged the upcoming Bioneers by the Bay conference in Massachusetts, another promoted the animal-powered field days in Tunbridge; and yet another urged attendance at the "headstand thing," a Burlington climate change rally with a feet-in-the-air component.

Todd chimed in with bits of advice and nods of the head, and then launched into the day's coursework, which centered on his own life's work. "It's kind of like his life story, and he uses that as a basis for teaching everything," said Philip Marston, a UVM environmental studies major from the Brooklyn borough of New York.

Todd "imparts wisdom" while "so many other teachers are just speaking at you," Marston said.

Todd was born and raised in Ontario. Today he splits his time between Winooski, a longtime residence on Cape Cod, and various international locales. This winter, he and his wife will return to Costa Rica to work on a reforestation project.

EDUCATION: Bachelor's and master's degrees from McGill University; doctorate from University of Michigan
BIG IDEA: To read Todd's white paper, "Comprehensive Design for a Carbon Neutral World: The Challenge of Appalachia," go online and visit www.oceanarks.org

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An early interest in nature led Todd to acquire bachelor's and master's degrees in agriculture and parasitology from McGill University in Montreal and a doctorate in fisheries from the University of Michigan.

Nancy Todd, who met her husband in high school, says the two of them have always loved the water. "We're both absolute water rats. Put us into any environment and we always gravitate toward the water."

After a brief stint teaching at San Diego State University, Todd moved to Cape Cod to work as an assistant scientist at the Woods Hole Oceanographic Institution. Many people would be more than content with a day job at the highly respected research facility, but not Todd.

He quickly launched a side venture. With his wife and a friend, he founded The New Alchemy Institute to explore ways to live without fossil fuels and raise food locally, year-round, even in harsh Northern climates. Todd was instrumental in creating a model farm/research center near Falmouth, where he and the other New Alchemists pioneered a tilapia fish farm, built windmills out of junked car parts, erected a self-heating and -cooling dome/greenhouse, and experimented with growing naturally pest-resistant vegetables and crops.

Todd showed his students a film about the venture, in which he, a strapping blond man in sideburns and jeans, worked with like-minded people in an environment that looked like a cross between a back-to-the-land commune and an outdoor lab.

New Alchemy and another nonprofit founded by Todd, Ocean Arks International, attracted many innovative thinkers, and Fuller himself visited one of their research domes on the Cape. "Bucky came to open it," said Nancy Todd, who remembers seeing Fuller walk in the dome. "He turned to John and his face just lit up like a child's, and said, 'This is what I always wanted to see, my architecture with your biology.'"

Cleaner cleanup

In the late 1970s and 1980s, Todd grew increasingly concerned about the chemicals used in water purification and sewage treatment and began to study alternatives. He developed methods of cleaning dirty waters with plants, sunlight and aeration.

With his son Jonathan Todd, he founded a company on Cape Cod that has implemented pollution solutions in Hawaii, China and across the U.S. In Vermont, Todd worked on an eco-farm project in the Burlington Intervale and ran an alternative sewage treatment project in South Burlington, among other projects.

The South Burlington Eco Machine opened in 1995 and operated for several years with a grant from the U.S. Environmental Protection Agency. Eventually it treated 800 gallons of sewage a day.

The sewage was diverted from the city's conventional treatment plant to a greenhouse, and then through a series of tanks, trays and floating aquatic plants. The system gradually cleansed the wastewater in a manner similar to the natural purification processes in swamps and streams.

The system was shut down after a few years and the greenhouse that housed it now sits empty next to the South Burlington Bartlett Bay wastewater treatment plant.

Chuck Hafter, South Burlington city manager, said that while innovative, the Eco Machine had limitations. It never reduced as much sludge as they hoped, and the wastewater it cleaned had to be run through the regular sewage plant for a final cleaning to reduce phosphorus levels enough to meet government standards.

And while it handled 800 gallons a day, that would barely dent the city's current load of about 3 million gallons a day. "I couldn't imagine it on a larger scale," Hafter said.

Will the Big Idea make it to the real world?

In his white paper, Todd estimates it could take the mountains and valleys scarred by coal mining a century to recover on their own. His proposals would dramatically accelerate nature's self-repairing capacity, Todd maintains.

Whether Todd's Appalachia fix will be implemented is an open question. It would take millions of dollars and collaboration between government, corporations and nonprofits.

The proposal — laid out in about 80 pages — would have regional land trusts take custody of the scarred lands, remineralize the soils, remediate the coal slurry, reforest the ground, and jumpstart local, sustainable enterprises such as tree nurseries and farms.

Gradually, the trusts would sell the land back to people and then move on to repair other scarred areas — thus restoring the land, piece by piece. Sure, it's a big idea, but Todd believes it could apply to many environmentally degraded areas, starting with Appalachia. "It's not an academic pipe dream," he said.

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