

A TREE GROWS IN MERCURY

PROF. RICHARD B. MKAGHER believes he will never see a landfill as lovely as a stand of trees. A genetic engineer at the University of Georgia, Meagher is heading an experiment in Danbury, Conn., to show that genetically modified cottonwood trees can safely and inexpensively cleanse soil of mercury. Currently, mercury-poisoned sites must be dug up and the polluted dirt hauled to special chemical landfills. That's an expensive process. An acre site could cost \$1 million to clean up. Meagher says it's tantamount to recycling the waste from one area to another.

Highly lethal, mercury is an element and can't be broken down. Meagher, however, reckoned that ionic or methyl mercury can be transformed by certain bacteria to metallic mercury, which is less toxic. He isolated a gene that can accomplish that task: the *incA*, from *E. coli* bacteria. The gene was then inserted into young cottonwood trees. It's hoped the trees will soak up the ionic mercury, transform it into metallic mercury and eventually transpire it into the air through their leaves. Cottonwoods grow rapidly and have massive root systems, which make them ideal for this project. The 160 saplings planted in Danbury have grown from 18 inches to 6 feet in less than a year.

Using plants to siphon toxic waste from polluted sites is called phytoremediation. This is the first test of the process using genetically modified trees. No plant or tree naturally absorbs mercury. "This is real beginning-level technology," Meagher cautions. "This is not a cleanup, just a field study." At the university, he's grown genetically modified plants in dirt contaminated with levels of mercury and arsenic that "would kill anything else," he says, and they're not only thriving, but ridding the soil of the pollutants.

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