

## COLUMBIA MISSOURIAN

# Local collector puts bottled water to the test

By [Brendan Gibbons](#)

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John O'Connor holds a microscope in the basement laboratory of his Columbia home. A retired MU professor and former chairman of the Civil Engineering Department, O'Connor has been comparing bottled water to ground water since 1980. Currently he runs a water consultancy company, and many of his clients are municipal water providers.

! [Elizabeth Cardwell](#)

COLUMBIA — John O'Connor flicked on the lights in his cluttered basement, illuminating an array of expensive microscopes, chemicals and water testing equipment.

“A lot of the equipment I have here is what you would see at a municipal water treatment plant laboratory,” O'Connor said.

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O'Connor, 80, runs his water quality consulting firm, H2O'C Engineering, from his house on Tahoe Court, along with his son,

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Retired MU professor John O'Connor has been collecting and studying bottled water since the early 1980s. O'Connor's extensive water bottle collection is currently on display at the University of California-Davis.

Tom. He formerly served as chairman of MU's Civil Engineering Department and chief of the Illinois State Water Survey.

Starting in the 1980s, O'Connor began collecting and testing bottled water. He ended up compiling a huge collection, complete with water quality data from his tests. He estimated that at its peak, the collection contained between 200 and 300 bottles. Some of the collection is now on display at the University of California at Davis.

In 2008, bottled water surpassed soda as the most popular drink in the U.S., according to an [Associated Press story](#) published March 11. The plastic used to make water bottles is a petroleum byproduct, and [about 17 million barrels of oil per](#)

[year is required to meet demands for bottled water in the U.S.](#), according to Earth Policy Institute.

O'Connor started his water collection as a side project. Around 1980, Monsanto Corp. awarded O'Connor a grant to buy water testing equipment he could use it to measure total organic carbon in treated drinking water.

The amount of organic carbon present in a water sample indicates how much broken-down material from dead plants, dead animals or feces has made its way into a water supply.

“Water treatment processes are not very effective at removing this type of material,” O'Connor said. “To the extent that you can find a water source that has a minimal amount of total organic carbon, you're better off.”

O'Connor could also estimate the number of bacterial cells present in a water sample by using a fluorescent dye to mark the cells, then counting them under a microscope.

Bacterial cell count and total organic carbon became the bases O'Connor used to judge the quality of a water sample.

“Although they weren't regulated, these were two critical parameters in judging how good a water really was,” he said.

One of O'Connor's first studies using his new equipment was a test of more than 100 drinking water samples from across Missouri. In the mid-1980s, he began to turn his attention to bottled water.

“We just had the equipment, and like kids with new toys, we were going to apply it to whatever we

could get our hands on,” he said.

O'Connor wanted to see if the water in the bottle measured up to the label. “The claims were getting extravagant, that is, bottled waters were safer and purer than tap water,” he said. “Sometimes it was, and sometimes it wasn't.”

Word began to get around that he was doing these tests, and soon friends and colleagues started bringing O'Connor and his students bottled water from around the world for them to test.

His collection started to grow. He began making a slide show of bottled water from different decades and from around the world. As he fact-checked the claims on the bottles, he wasn't afraid to mock the companies' marketing ploys.

In his slide show, he calls Perrier's green, bowling-pin-shaped bottle a “fashion accessory for yuppies.”

A bottle of Canadian Essence Natural Spring Water displays a pristine lake on its label, complete with a duck and a snowy forest. In response, O'Connor jokingly offered this train of false logic: “Cold water tastes good! It's cold in Canada! Canadian water tastes good!”

His tests showed the truth. “No lake here,” he wrote. “The data indicate a moderately hard groundwater.”

He mentioned Mountain Valley Spring Water, bottled in Arkansas, as an example of quality bottled water.

“It's very much like many of the Missouri well waters from the southern part of the state,” he said. “It's basically rain water infiltration, and it's stored in aquifers that are basically limestone.”

Most bottled water is no better than the water you get from your tap, O'Connor said. His slide show spells it out: “Despite advertising illusions, most of the water sold in the U.S. is groundwater; 25 percent is derived from municipal water sources.”

No bottled water can compete with the water that comes out of an MU drinking fountain, O'Connor said. Some of the highest quality water O'Connor has ever tested lies more than 1,000 feet below Columbia.

“It is far superior to most potable waters,” he said.

O'Connor said he used MU's drinking water as a reference because it has the lowest level of organic carbon and bacterial cell count of any water he's ever measured.

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O'Connor posted the results of his bottled water project on his [blog](#). A few years ago, it got the attention of Allen Doyle, sustainability manager for the University of California at Davis.

“I saw John's slide show on the American Chemical Society's website and was tickled with its mix of irony and facts, and the breadth of issues,” Doyle said in an email.

Doyle emailed O'Connor to thank him, and the two struck up a correspondence. When O'Connor mentioned that he might throw his collection away, Doyle offered to keep it for a while.

O'Connor shipped Doyle most of his collection about two years ago, though three of the four boxes he shipped were smashed or lost on the way to California. The bottles that arrived intact sat in Doyle's office until he thought of a use: a display in one of the university's student centers.

The three-month display went up in February. Titled “[Water: Fact or Fashion,](#)” it features O'Connor's collection, facts about bottled water's toll on the environment and a whiteboard where students can respond to a series of questions about water use.

“We want to challenge each viewer to draw their own conclusions and boundaries — When would you use a disposable water bottle?” Doyle said.