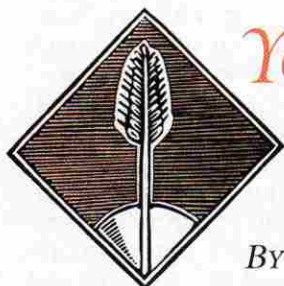


# GREEN LIVING

WITH  
THE  
EARTH  
IN  
MIND



## YOUR HEALTH

### Drugging Our Water

We Flush It, Then We Drink It

BY MELISSA KNOPPER

**B**irth control pills, estrogen replacement drugs, ibuprofen, bug spray, sunscreen, mouthwash and antibacterial soap: all of these products could turn up in your next glass of tap water, according to the United States Geological Survey (USGS). Last summer, USGS scientists sampled 139 rivers and streams, finding hundreds of prescription and over-the-counter drugs and personal care products lingering in the nation's water supply.

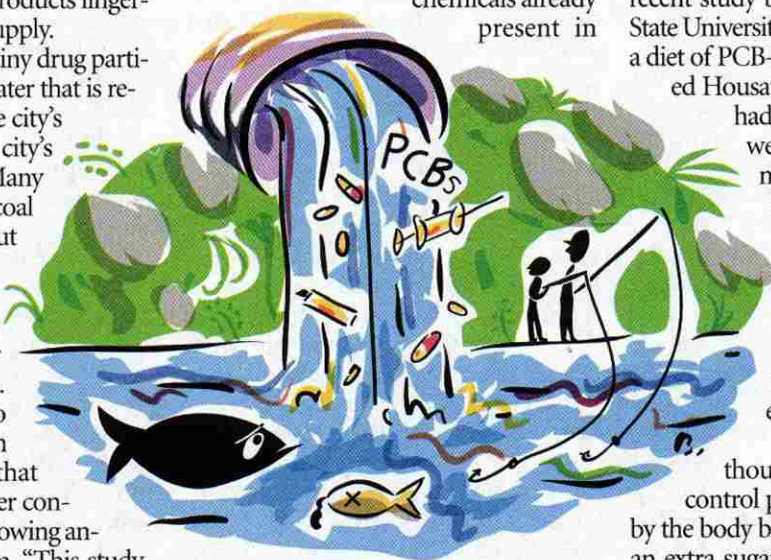
In many cases, these tiny drug particles were found in river water that is recycled—flowing from one city's sewer plant into another city's drinking water system. Many cities can't afford the charcoal filters required to screen out the final traces of these byproducts from drinking water. Rural homeowners who use well water are at an even greater risk. USGS researchers also turned up antibiotics in nearly half the streams that were sampled, raising other concerns about the nation's growing antibiotic resistance problem. "This study raised a bunch of red flags," says Dana Kolpin, lead author of the USGS study. "At these low concentrations, I think there are going to be long-term effects that may take several generations to show up."

#### A Threat to Reproductive Health

The dangers of endocrine-disrupting water pollutants such as dioxin and polychlorinated biphenyls (PCBs) are well known—they have been linked to a variety of reproductive health problems, from endometriosis to low sperm

counts. Synthetic hormones in the water may have similar health effects—on both people and wildlife—at very low levels of exposure. "All of these compounds are going into a chemical soup," says Theo Colborn, senior scientist at the World Wildlife Fund (WWF) and author of *Our Stolen Future*.

Colborn says she is worried about pharmaceutical estrogens mixing with chemicals already present in



streams. "You can liken it to side effects of a prescription drug—you don't know how it's going to interact with the over-the-counter drugs you're taking," Colborn says. "It's the unexpected, interactive effects that are a real concern."

For example, she says, bisphenol A, a component of plastic, causes female mice to reach puberty earlier than normal. Bisphenol A forms a weak bond with the body's estrogen receptors. It can scramble a cell's natural communication system and cause it to replicate too quickly. That,

in turn, raises concerns about breast cancer in humans. What happens if this compound, which is active at low levels of exposure, combines with estrogen from a birth control pill in the water? At this point, it's still unclear. Colborn says, "It could have long-term health effects."

These estrogens also could have an additive effect with chemicals such as PCBs, which are found in animal tissue. A recent study by researchers at Michigan State University found mink that were fed a diet of PCB-laden fish from the polluted Housatonic River in Connecticut had offspring with lower birth weights and higher infant mortality rates. Housatonic Riverkeeper Tim Gray, a member of the New York-based Waterkeeper's Alliance, wonders if PCBs interfere with the mink's reproduction, what will synthetic estrogen and other drugs do?

Until recently, people thought the estrogens in birth control pills were rendered inactive by the body because the kidneys tack on an extra sugar molecule before they are excreted, says William Owens, a toxicologist who researched estrogen patches for Proctor & Gamble. But now, scientists have learned bacteria in sewage treatment plants chew off that sugar molecule.

A British researcher, John Sumpter, contributed to this discovery while studying fish living near a London wastewater treatment plant. He found male fish that were producing eggs. After he found the compound estradiol in the fish tissue, he concluded estrogens from birth control pills were part of the problem.



## Antibiotic Resistance is Growing

Another active area of research and debate is antibiotic resistance. The Union of Concerned Scientists says farmers use 70 percent of antibiotics in the U.S. Large factory farms use antibiotics to prevent confined, crowded livestock from getting sick. But that practice is creating "superbugs," such as virulent strains of salmonella that can be deadly to humans and difficult to treat. Those superbugs may spread to consumers through contaminated meat or wells, says Dr. John Balbus of Environmental Defense.

Meanwhile, thousands of pounds of triclosan—the active ingredient in antibacterial soaps, deodorants and household cleaners—are also going down the drain into our waterways. Susan Cellura, a spokesperson for Ciba Specialty Chemicals, which manufactures triclosan, says the chemical does not contribute to antibacterial resistance. She quotes a recent report by the European Commission's Scientific Steering Committee, which concludes: "There is no convincing evidence that triclosan poses a risk to humans or the environment by inducing or transmitting antibacterial resistance under current conditions of use." Ciba also claims that triclosan does not pose any health

threat to wildlife or humans because it's present in water at very low levels.

But other studies have shown that triclosan *does* contribute to the resistance problem. Because triclosan is a broad-spectrum antimicrobial agent, it kills all bacteria—even the beneficial kind. That, in turn, creates an environment where the superbugs can flourish, says a Tufts University study. The Tufts researchers also argue that the levels of triclosan in common handsoaps and cleaners are not strong enough to kill certain harmful bacteria. In an August report, the American Medical Association called on the scientific community to do a more thorough review of whether antibacterial consumer products do more harm than good. "The use of these products have never been shown to be superior, to my knowledge, to regular soap and water," says Dr. Tamar Barlan, director of the Center for Science in the Public Interest's project on antibiotic resistance.

## Protect Yourself—and the Environment

So what are the solutions? Legislation could be one option. The government could, for example, require all cities that use treated wastewater for drinking to install charcoal filters, although that type of legislation won't likely be passed until

research pinpoints exactly how risky these substances can be. But until recently, says Kolpin of the USGS, researchers had no way to even measure these compounds at the very low levels they appear in streams. Waterkeeper's Gray joins the WWF and other green groups in the call to enact stronger clean water laws. "This new report paints a scary picture of what's out there in our rivers and lakes," he says.

In the meantime, WWF's Colborn recommends some preventative steps:

- **Use** condoms instead of birth control pills;
- **Choose** natural menopause remedies instead of prescription hormones;
- **Return** old prescriptions to the pharmacy rather than flushing them;
- **Avoid** unnecessary use of antibiotics and clean with plain old soap and water.
- **Switch** to antibiotic-free meat or a vegetarian diet.

**CONTACT:** Campaign to End Antibiotic Overuse, (202)572-3250, [www.KeepAntibioticsWorking.com](http://www.KeepAntibioticsWorking.com); Waterkeeper Alliance, (914)674-0622, [www.keeper.org](http://www.keeper.org). **E**

**MELISSA KNOPPER** is a Denver-based science writer.

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