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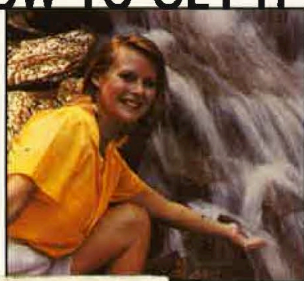
Rick Stamp

EMOTIONAL FIRST AID

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WONDERFUL WATER: HOW TO GET IT



THE BUYER'S GUIDE TO BACKACHE ENDERS

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Wonderful Water: How to Get It

The next time you drink to your health,
make it with a glass of clean H₂O . . .
from your own tap.

BY DENISE FOLEY

For some of the residents of the tiny hamlet of Baumstown, Pennsylvania, the Amityville Horror house with its oozing walls and turbid tap water was no movie matinee nightmare. Something just as terrible was happening to them in their town.

One woman, rinsing her young son with a hand shower, suddenly found herself spraying him with black gook. Others complained they grew dizzy and couldn't breathe in the shower. Very few families hadn't been touched by cancer.

"People were complaining of chronic headaches and various health disorders that just perplexed them," says Rick Stump, laboratory director for Suburban Water Testing Laboratories, Inc., one of the water-quality firms called by residents to track down the cause of their predicament.

One suspected culprit was easy enough to isolate. Water drawn from several of the wells in this small com-

munity near the homestead of pioneer Daniel Boone contained a common chemical degreaser called trichloroethylene, or TCE. In some wells this suspected carcinogen was there in 1,000 parts per billion. The EPA proposes zero as the only safe amount.

Baumstown is far from an isolated incident. A top government expert on water quality calls surface- and ground-water pollution the number-one environmental problem of the 80's. According to the experts—and the statistics—no one is safe. At any time, you may find a monster lurking in your tap.

For the residents of Fallon, Nevada, it was arsenic. For 3,000 residents of Woburn, Massachusetts, it was TCE. For the people in Scranton, Pennsylvania, it's a minute organism called *Giardia lamblia* that has made their municipal water supply undrinkable. For the thousands of Louisianans whose drinking water came from the mighty Missis-

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sippi, it was a grim bisque of chemicals, including a set of related compounds called trihalomethanes, produced when chlorine is used to disinfect drinking water.

The figures are even more alarming than the stories. According to the EPA, 45 percent of the large public water systems served by groundwater are contaminated by organic chemicals, and 63 percent of all rural residents—that's nearly 39 million people—drink contaminated and possibly unsafe water. Gene Rosov, president of WaterTest Corporation, a national water-testing firm, says that 20 percent of all the water samples his technicians analyze contain some kind of bacterial contamination and as much as 30 percent contain measurable lead.

A TREATABLE PROBLEM

An overwhelming problem? That's an understatement. Hopeless? Not so, say the experts. "I know of few situations that aren't treatable," says Don Saltman, president of Suburban Water Testing Laboratories and a member of the board of directors of the Water Quality Association, an organization of dealers, manufacturers and suppliers of water-treatment systems.

The people of Baumstown who called in Suburban Water were able to clean up their water with point-of-use filters

traordinarily fertile ground: In recent years, Pennsylvania has experienced a high incidence of waterborne diseases. What he has seen in the last 25 years is an increasing anxiety over what once was taken for granted and is now an endangered species: clean water.

"Ten years ago, people never had their water checked. Now when I run into

Add something
new to the
endangered
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clean water.

people on the street they say, 'Gee, I haven't had it done in two years. I guess it's about time,' " he says. "But the other thing I see, which concerns me, is that people are also tending to not do anything about it. You see people on TV who live a mile from a landfill and they're walking two miles a day to get water. If you told them that for under \$1,000 you can probably treat their tap water, they'd say fine, who's going to pay for it? The attitude seems to be I'd rather walk two miles every day because I want the government—or somebody—to pay for it.

thing now. The EPA estimates that Americans bought two million drinking-water treatment units for their homes in 1979. The Water Quality Association is predicting a sales increase this year of 20 percent. Clearly, the concern is there. But is the knowledge? How do you know if your drinking water is safe? If it isn't, what do you do about it?

Does your water look more like iced tea? Then you really need to test.

Is a \$20 filter from the hardware store as effective as the \$800 one you buy from your Culligan man? Are all contaminants equally evil?

The place to start this modern variation on water divining is at your tap. Some water problems are obvious. If your water looks more like iced tea than something that once flowed from a crystalline mountain stream, or if it tastes as foul as week-old fish, you'll certainly want to have it tested. A "rotten egg" odor may mean you have too much hydrogen sulfide gas in your water. A salty taste may mean too many minerals. Turbidity—the cloudiness of your water—may be due to the presence of organic or inorganic particles, some of which are dangerous, some not.

Unfortunately, some of the most serious problems are invisible. You won't see coliform bacteria swimming in your bathtub, nor will lead particles collect on the bottom of your cup like tea leaves. If you *taste* arsenic, says one EPA official, "then there's so bloody much in there you've gotten a lethal dose." Chemicals like TCE often signal their presence by an epidemic of headaches and dizziness, as in Baumstown, or by childhood leukemia and birth defects, as in Woburn, Massachusetts. The people of Scranton only learned of the *giardia* cysts in their water supply when residents started getting sick.

How do you know when to test? "If the taste or odor of your water changes, or if you live in close proximity to a potential source of pollution, such as a landfill, you might want to test," suggests Victor Kimm of the EPA's Office of Drinking Water.

You might want to test even if you live hundreds of miles from the nearest landfill.

Although the federal government requires water systems serving more than 25 people to monitor drinking water supplies for bacteria, trace metals and a few other contaminants, not all water authorities are created equal. In 1982 alone, there were 70,000 violations of drinking water standards by municipal water systems.

"In some places the 'system' is little more than a pond and a chlorine feeder to kill bacteria," says Rick Stump. "They take the pond water, add chlorine and send it down the hill, unfiltered. Some-

times there are no fulltime employees. Somebody goes up once a day or once a week to check on the system to see if it's still working—or still there."

If you want to know the results of the routine tests done at your hometown water-treatment plant, just ask. It's public information. But there are some problems that occur after the water leaves the plant—lead pollution, for instance—that won't appear on their reports. And there are a great many dangerous contaminants they're not required to test for.

If you decide to test your own water, suggests the EPA's Victor Kimm, talk to local health officials about the kinds of contaminants you should be looking for. Suburban Water and WaterTest, which does its analyses nationwide by mail order, provide a basic test package that gives you a screening for under \$100. Comprehensive tests for individual contaminants can multiply into big money, but a more basic test may be all you need. If you do live near a landfill or if you've read in your local newspaper about contaminated wells near you, make sure you test for toxic chemicals (it's called, appropriately, a TOX test) and heavy metals.

WHAT TO TEST FOR

Whatever laboratory you use, here are a few of the most common contaminants you will probably want to look for in your water:

COLIFORM BACTERIA. Found in the feces of humans and other warm-blooded animals, these bacteria aren't

ordinarily harmful in themselves. But they are the red flag that signals the presence of other, more dangerous bacteria in your water. The U.S. government guidelines call for an average of 1 or less per 100 milliliters of water.

NITRATES AND NITRITES. Common in rural wells because they're part of the runoff from manured or fertilized fields, these substances also occur in municipal and industrial wastewaters, refuse dumps, animal feedlots and septic tanks. The government guidelines stipulate a maximum contaminant level of 10 milligrams per liter of water, which is aimed at preventing a sometimes fatal condition that diminishes the oxygen-carrying capacity of the blood in infants. Nitrates/nitrites are also associated with stomach cancers, although there has been no clear link to nitrates/nitrites in drinking water.

TRACE METALS. While some metals, such as magnesium, calcium and zinc, may actually be good for you, others can cause serious harm. You don't want to see large amounts of mercury, cadmium or chromium in your water. Recent headlines have sent homeowners across the United States scurrying to seek out lead solder in their water pipes. In some places in the country, particularly in areas with soft, acidic water, lead has been leaching out of the pipes and turning up in drinking water. In Boston, says Gene Rosov, nearly 18 percent of the water samples taken from the city's water supply were high in lead.

Though lead poisoning is rare, chronic lead toxicity can cause severe health

problems, particularly in children. It occurs even with a low daily intake of lead because the mineral accumulates in bones and tissue. Less harmful but still a nuisance are the metals iron and manganese, which can stain laundered fabrics and can make drinking a glass of water from the tap virtually indistinguishable from sucking on the tap itself.

TOXIC CHEMICALS. TCE, PCB (polychlorinated biphenyls), carbon tet (carbon tetrachloride)—they're the too-familiar nicknames for some of the more common man-made poisons in our drinking water. Many have been found to cause cancer and genetic changes in laboratory animals. What is known about their effects on humans comes largely from accidental exposures, frequently inhalation or ingestion of large doses.

Water First Aid

Here are a few emergency measures to give you clean drinking water until the water-quality professional arrives:

■ Let your water run for three to four minutes before you use it every day. This helps flush out any lead, cadmium and cobalt that may be lingering in the pipes.

■ Whip up your water in the blender for 15 minutes with the top off. Aeration removes chlorine and chlorinated organics.

■ Boil water (uncovered) for at least 20 minutes before using it. This removes bacteria and some organic chemicals.

However, they may be the best known and feared contaminants . . . by anyone who has ever heard of New York's Love Canal.

TRIHALOMETHANES. The commonly used water disinfectant chlorine has given us a possible Sophie's choice: cholera or cancer? Chlorine, which kills bacteria in drinking water, also apparently reacts with other substances in the water to form compounds called trihalomethanes. One is chloroform, which has been shown to cause cancer in laboratory animals and may be linked to some human cancers.

Although you may now be familiar with the rogues' gallery of water pollutants, once you've gotten the results of your water test, you're going to need a translation. A water-quality expert—who may have done your test and sells water-treatment systems—can help you decide whether you need further tests or a device to turn your witches' brew into something more potable. If you're looking for more objective advice, try your local health officials. Unless you have a background in chemistry, you're probably not equipped to analyze test results yourself.

"The science of toxicology is built on the notion that level counts," says Victor Kimm. "Clearly some pollutants are more potent and toxic than others. A little bit of one is of more concern than a large amount of another. You do need help interpreting results."

Once you understand exactly what you're drinking, what do you do? An uninformed consumer can become bewil-

problems, particularly in children. It occurs even with a low daily intake of lead because the mineral accumulates in bones and tissue. Less harmful but still a nuisance are the metals iron and manganese, which can stain laundered fabrics and can make drinking a glass of water from the tap virtually indistinguishable from sucking on the tap itself.

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tered by all the gadgetry that promises to turn turbid, toxic tap water into something akin to free champagne. Worse, you could choose a water-treatment system totally inappropriate for your water problems and, feeling secure, blithely drink water that's as bad or even worse than before.

SYSTEM CHECKLIST

To help you make a decision, here's a scorecard of the major water-treatment systems, what they can and can't do:

ACTIVATED CARBON. A method older than Plato, this system is effective at removing chloroform, chlorine, some pesticides, organic chemicals and bad taste and odor. The contaminants cling to the porous surface of the carbon, which is usually contained in a replaceable filter. But carbon, or charcoal, filters have one serious drawback: They require vigilant maintenance. John T. Cookson Jr., president of JTC Environmental Consultants in Maryland, has done a number of laboratory water tests for Consumer's Union. He warns that the organic material that collects on the carbon surface can supply a food source for bacteria that may produce endotoxins. These poisonous substances, thought to be carcinogenic, may eventually wind up in your "clean" water.

Consumer Reports, which rated 17

chloroform than the water going in. Most experts agree that *granular* carbon is the best, and that frequent changing is essential. You may not be able to rely on the manufacturer's instructions, however. Rodale's *New Shelter* magazine found that the effectiveness of most filters declined markedly long before the manufacturer's indicated lifetime.

In *Consumer Reports'* tests, under-the-sink models were more effective in the long run in removing chloroform than the faucet models, which are usually less expensive.

Also to be avoided are those activated-carbon units containing silver as a bacteriostat. Silver has not been shown to be an effective bacteria killer and is harmful in itself if it leaches into your drinking water.

DISTILLATION. This is a simple method of treatment. Water is heated until it turns to steam and then the steam is condensed into water. Theoretically, this removes all bacteria and contaminants from the water. But theory isn't practice. Distillation systems don't necessarily remove chloroform and other organic chemicals, which can vaporize with the water and recondense. *New Shelter* found that using an activated-charcoal filter with a distiller will increase its organic-removal rate to over 90 percent. You may need pretreatment

ruses, pyrogens (fever-causing substances), hydrocarbons, asbestos, most pesticides and other chemicals. It doesn't remove chloroform. Many R-O systems contain three different membranes, which rely on water pressure to help remove pollutants. The cellophanelike membranes vary in characteristics and price. The condition of your water should determine which one is best for you. Installation is usually not a do-it-yourself project, and the membrane cartridges have to be replaced every one to three years. You may have to have your water treated if it's hard or full of iron. And if your water pressure isn't sufficient, you may need to add a small pump, all of which increases your cost. Basic prices for an R-O system are in the \$450 to \$850 neighborhood.

ULTRAVIOLET. Some municipal water systems use ultraviolet systems to kill bacteria and reduce the amount of organic chemicals in treated water. UV radiation doesn't add anything to the water, as does chlorine, but it can have its drawbacks. It's not effective on some viruses, for instance, and energy costs can be expensive. Doubling up with another filter to eliminate sediment increases the UV system's effectiveness, in part because it doesn't work well in cloudy or dirty water.

If you haven't found the one treatment device to solve all your problems, don't be alarmed. Some water problems require two or more units, says Douglas Oberhamer, executive director of the Water Quality Association.

"You may find you need a prefilter,

an activated carbon unit and reverse-osmosis system or some other combination to take care of your water troubles," says Oberhamer. "A professional will be able to help you design the best system for you."

A WATER RESOURCE GUIDE

For more information or advice, write or call:

Water Quality Assn., 4151 Naperville Rd., Lisle, IL 60532; (312) 369-1600.

WaterTest Corp., Box 186, New London, NH 03257; (800) H₂O-TEST (426-8378).

Clean Water Action Project, 733 15th Street NW, Suite 1110, Washington, DC 20005; (202) 638-1196.

A helpful reading list:

Troubled Water by Jonathan King, (Rodale Press, 1985); *Drinking Water and Health* (National Academy Press)—several volumes; *The Health Detective's Handbook* by Marvin Legator (Johns Hopkins University Press, to be published this year); "Giving Your Water the Treatment," by Craig Canine, *New Shelter*, June, 1985; "Water Filters," *Consumer Reports*, February, 1983; *Water Treatment Handbook*, produced by *New Shelter*, is available by sending a check for \$10, made out to "Product Testing," to Water-Treatment Devices, Box 451, Emmaus, PA 18049. ■