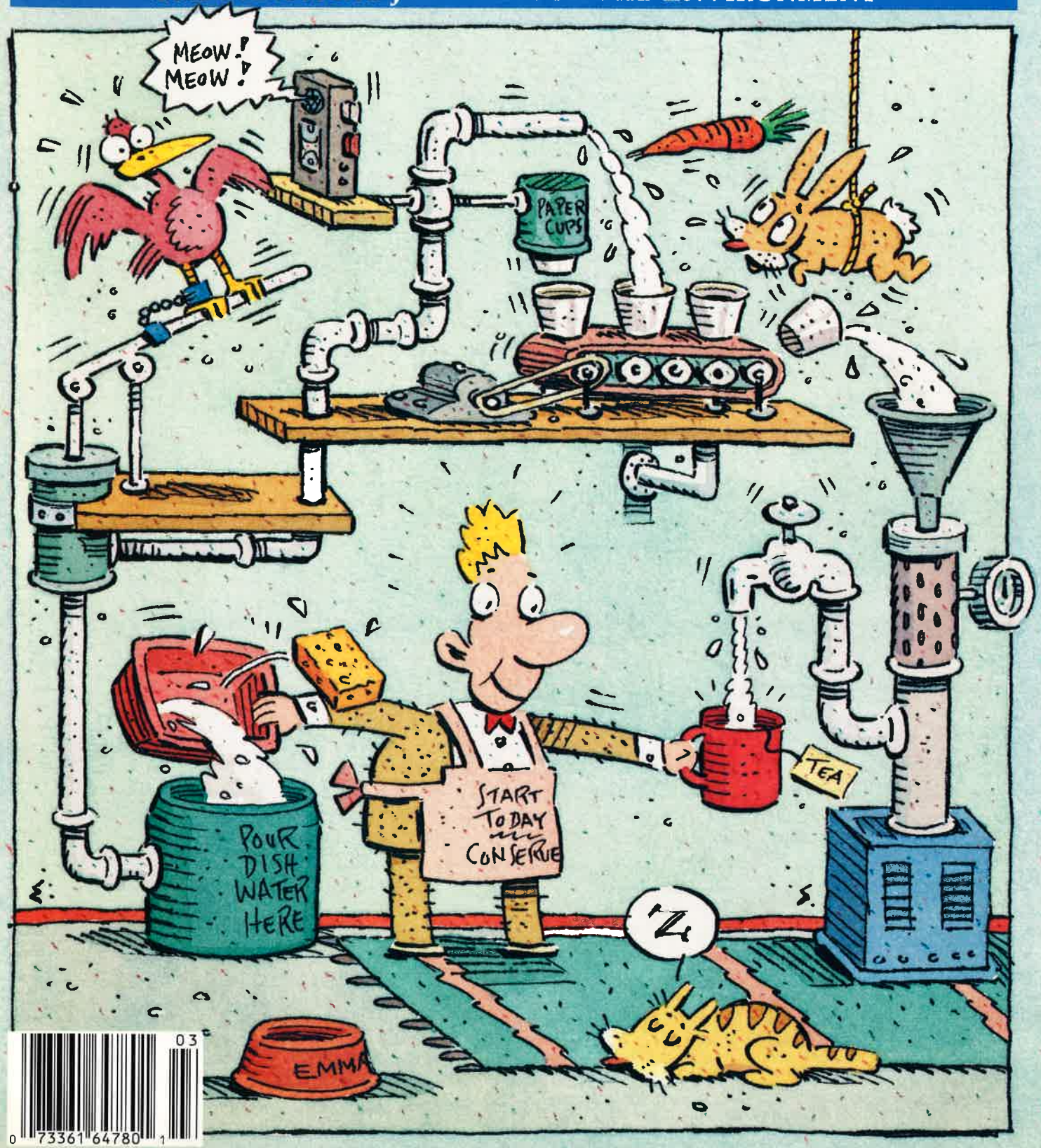
WATER OUGHTTAS: THE HOW-TOS

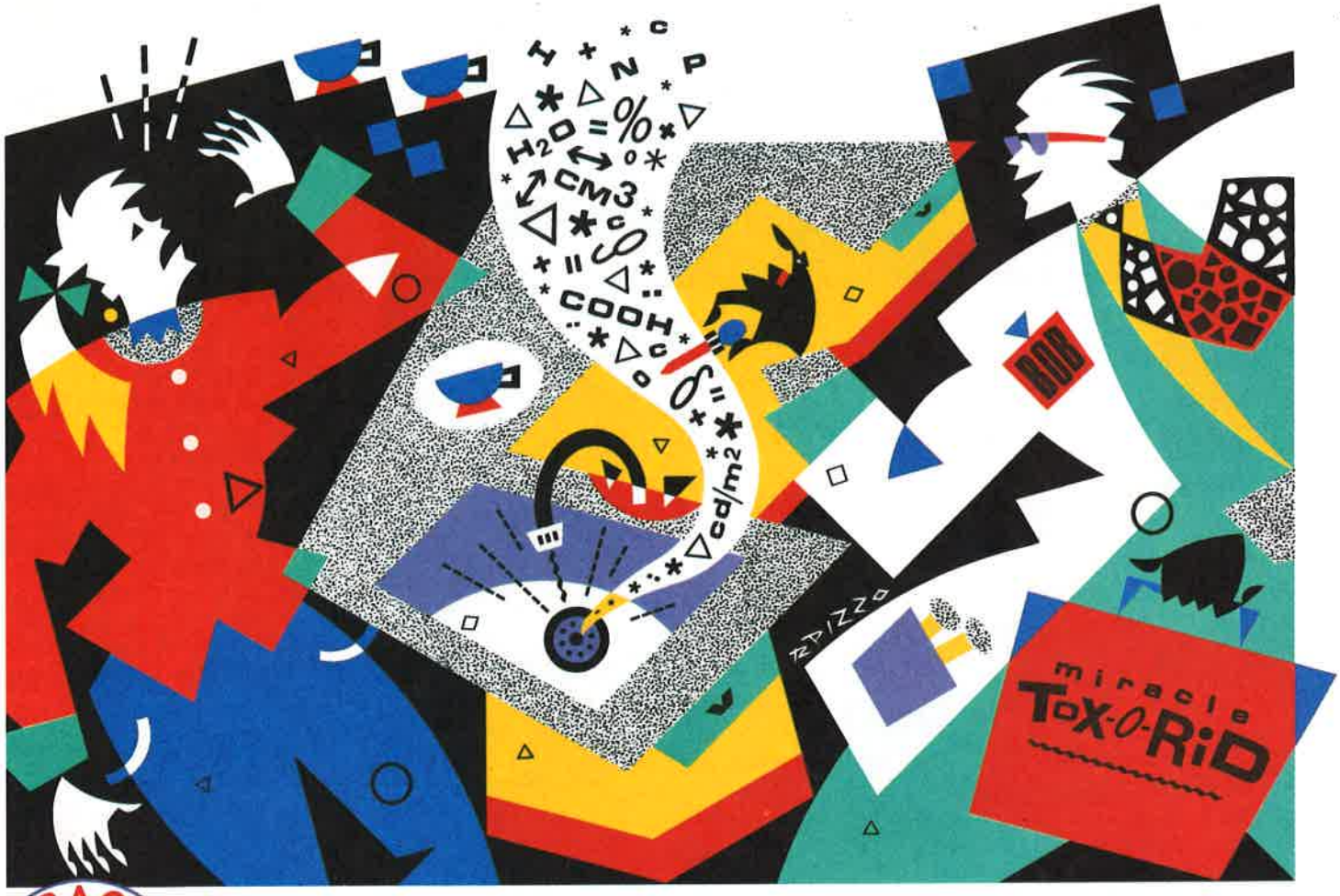
MARCH/APRIL 1991 $3.95
CANADA $4.95

GARBAGE

THE PRACTICAL JOURNAL FOR THE ENVIRONMENT



03
0 73361 64780 1



ILLUSTRATIONS BY ROBERT PIZZO

GARBAGE REPORT ON

HOME WATER PURIFIERS

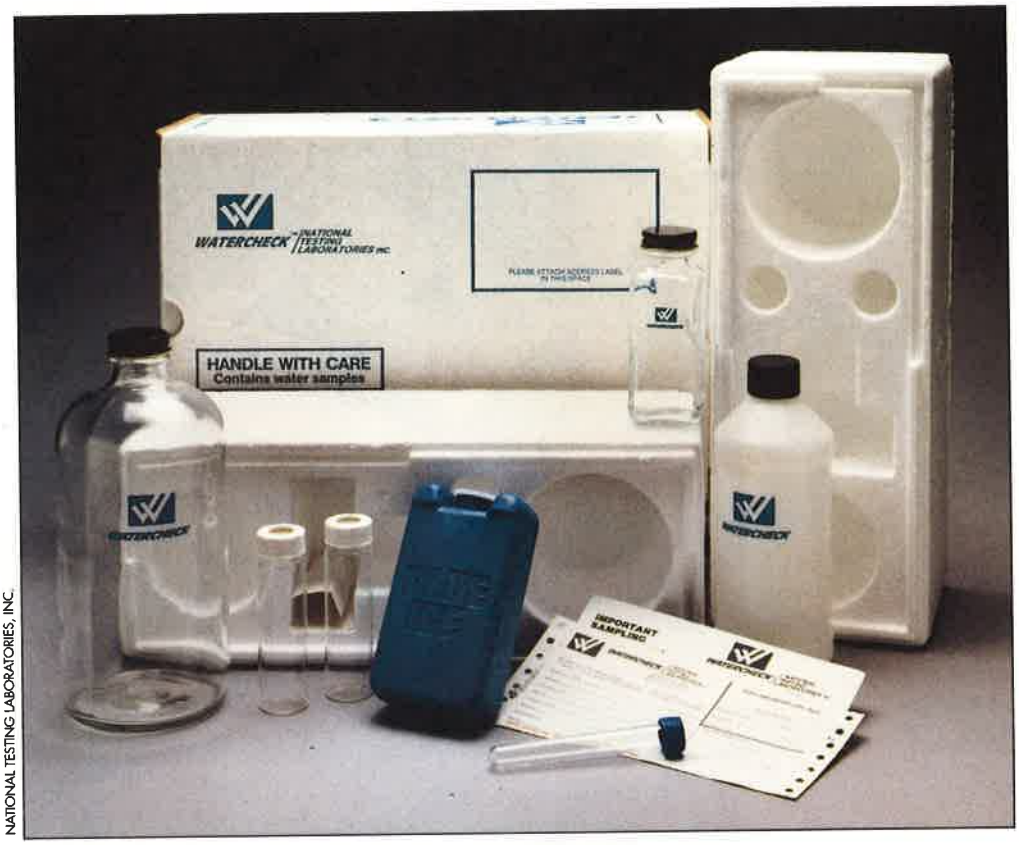
HOW TO MAKE A RATIONAL PURCHASE

"CONGRATULATIONS!!! YOU ARE *ABSOLUTELY GUARANTEED* TO RECEIVE ONE OF OUR TOP FIVE FABULOUS PRIZES."

So promised the postcard that Terry Hudson of Calabasaf, California, got last July. When he called the long-distance number printed on the postcard, a voice on the other end screamed in apparent excitement, "MY GOD!!! You've got one of the top numbers! It's the 1990 Chrysler convertible!"

BY JACQUELINE MACDONALD

The EPA took no civil actions against Safe Drinking Water



NATIONAL TESTING LABORATORIES, INC.

Numerous labs sell test kits through the mail — a bargain when compared to "free" tests done by a salesperson.

There was just one little string attached. When Terry called back to claim his car, the phone rep launched into a pitch for a *water filter*. "They told me the filter would remove minerals and all kinds of contaminants, down to the microgram." Terry was informed he'd have to purchase a filter to guarantee his prize. The charge: $493, for a unit whose retail value is actually $50 to $75, according to Federal Trade Commission attorneys. Terry Hudson did receive the filter, but never the prize.

Nationwide, reports of deceitful tactics used to sell water filters are increasing. Telemarketing with promised but never-delivered prizes is one tactic. Another is to convince customers that their water is unsafe to drink. To raise a false alarm about water pollution, peddlers from a California water-filter company went door-to-door clad in doctor's smocks and armed with clippings about toxic-waste dumps. Solicitors from a Maryland company collected water samples from homeowners and returned later with phony lab results that they claimed proved the water was unsafe.

Erik Olson, an attorney who monitors drinking-water regulations for the National Wildlife Federation, says that the NWF has "a real concern with the scare tactics being used" to sell these treatment units. He and other experts I surveyed — including professors, EPA officials, and water-utility spokesmen — warn that some devices sold as cure-alls for polluted water are useless.

There *are* legitimate water-treatment devices on the market (read *Water Worries? Here's Help* on p. 34 for recommendations). To find one, though, you have to navigate your way through a sea of deliberate overstatement and confusion. The first step is simply to find out exactly what *is* in your tap water.

HOW SAFE IS TAP WATER?

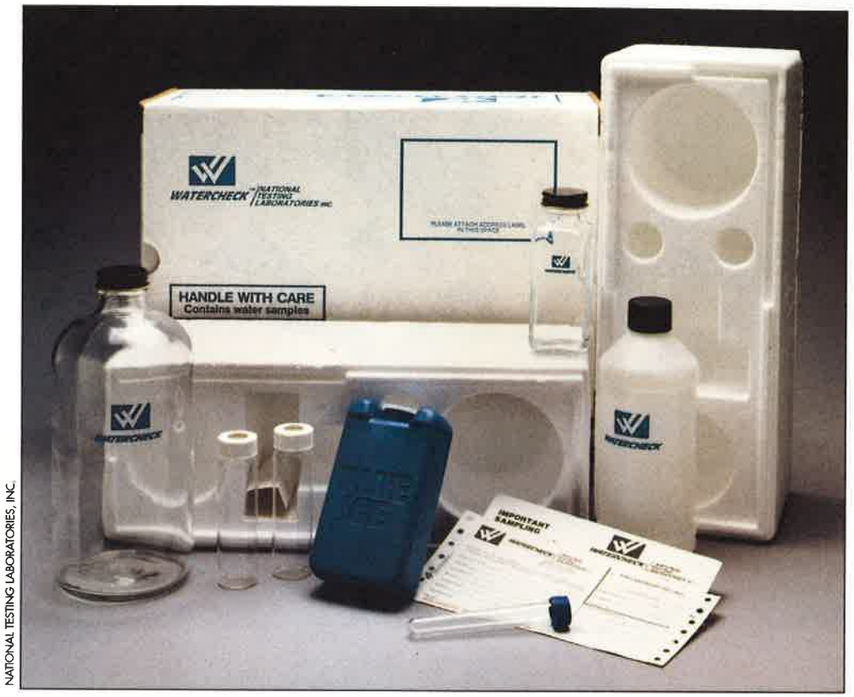
In theory, the 85% of us who draw our water from public supplies (the other 15% own private wells) should feel our water is safe, because federal law regulates public water supplies. The Safe Drinking Water Act requires that water utilities provide treatment to guard against 83 priority contaminants. In practice, however, the Safe Drinking Water Act may be no guarantee of safety. One big problem is that the Environmental Protection Agency, charged with enforcing the Act, rarely prosecutes violators. According to NWF Attorney Olson, the EPA took no civil actions against Safe Drinking Water Act offenders in all of 1989.

In part because of the EPA's lax enforcement, contaminants occasionally slip through municipal utilities' treatment processes. In one notorious drinking-water pollution case, 19 children in Woburn, Massachusetts, died of leukemia. Scientists linked the deaths to two industrial solvents, trichloroethylene and perchloroethylene, which had leaked into community wells.

Just how widespread illness caused by drinking-water contamination is, nobody knows. Experts tend to play down the prevalence of cancer-causing industrial chemicals in water. Says Al Stevens, a director of the EPA's Office of Drinking Water, "The risk of getting cancer from drinking water is small. In fact, there's a controversy over whether it exists at all."

But episodes like Woburn do create legitimate cause for concern.

The EPA took no civil actions against Safe Drinking Water Act offenders in all of 1989.



NATIONAL TESTING LABORATORIES, INC.

Numerous labs sell test kits through the mail — a bargain when compared to "free" tests done by a salesperson.

There was just one little string attached. When Terry called back to claim his car, the phone rep launched into a pitch for a *water filter*. "They told me the filter would remove minerals and all kinds of contaminants, down to the microgram." Terry was informed he'd have to purchase a filter to guarantee his prize. The charge: $493, for a unit whose retail value is actually $50 to $75, according to Federal Trade Commission attorneys. Terry Hudson did receive the filter, but never the prize.

Nationwide, reports of deceitful tactics used to sell water filters are increasing. Telemarketing with promised but never-delivered prizes is one tactic. Another is to convince customers that their water is unsafe to drink. To raise a false alarm about water pollution, peddlers from a California water-filter company went door-to-door clad in doctor's smocks and armed with clippings about toxic-waste dumps. Solicitors from a Maryland company collected water samples from homeowners and returned later with phony lab results that they claimed proved the water was unsafe.

Erik Olson, an attorney who monitors drinking-water regulations for the National Wildlife Federation, says that the NWF has "a real concern with the scare tactics being used" to sell these treatment units. He and other experts I surveyed — including professors, EPA officials, and water-utility spokesmen — warn that some devices sold as cure-alls for polluted water are useless.

There *are* legitimate water-treatment devices on the market (read *Water Worries? Here's Help* on p. 34 for recommendations). To find one, though, you have to navigate your way through a sea of deliberate overstatement and confusion. The first step is simply to find out exactly what *is* in your tap water.

HOW SAFE IS TAP WATER?

In theory, the 85% of us who draw our water from public supplies (the other 15% own private wells) should feel our water is safe, because federal law regulates public water supplies. The Safe Drinking Water Act requires that water utilities provide treatment to guard against 83 priority contaminants. In practice, however, the Safe Drinking Water Act may be no guarantee of safety. One big problem is that the Environmental Protection Agency, charged with enforcing the Act, rarely prosecutes violators. According to NWF Attorney Olson, the EPA took no civil actions against Safe Drinking Water Act offenders in all of 1989.

In part because of the EPA's lax enforcement, contaminants occasionally slip through municipal utilities' treatment processes. In one notorious drinking-water pollution case, 19 children in Woburn, Massachusetts, died of leukemia. Scientists linked the deaths to two industrial solvents, trichloroethylene and perchloroethylene, which had leaked into community wells.

Just how widespread illness caused by drinking-water contamination is, nobody knows. Experts tend to play down the prevalence of cancer-causing industrial chemicals in water. Says Al Stevens, a director of the EPA's Office of Drinking Water, "The risk of getting cancer from drinking water is small. In fact, there's a controversy over whether it exists at all."

But episodes like Woburn do create legitimate cause for concern.

TESTING YOUR WATER

To find out whether your water is safe — and whether you need a filter — have your water tested by an independent lab. Call your state health department for recommendations. Or try one of the mail-order outfits listed under *Labs* on p. 34. The cost of mail-order service ranges from $19 to $148, depending on how many contaminants you want to test for.

Heed this caution: *Do not* invite a filter salesperson to your house to do a "free" water test, as advertised in the phone book. The test that salespeople typically offer is like a hocus-pocus magic show: It's meant to mystify you, but it won't tell you whether life-threatening contaminants have infiltrated your water.

One favorite "free test" goes like this: Salesperson fills a test tube with your water, then adds a chemical. Presto! Your water turns yellow. Or maybe sediment forms. Salesperson says, "Serious contamination! Your water turned yellow." Or, acting dismayed, "Look at all those unhealthy solids!" What they don't tell you is that the change in the water sample was caused by the chemical reacting with chlorine (used nationwide to disinfect water) or with harmless minerals (which precipitate as sediment). According to such "tests," there's not a tap in the country that delivers safe water.

THE LIKELY SUSPECTS

Hundreds of toxins have been identified in drinking water over the years. How do you know which contaminants to test for? Here are the most likely suspects:

• **Lead:** Lead can leach into your water from lead service pipes or lead/tin solder in copper plumbing (illegal as of 1986). In the low levels found in water, lead can cause learning disabilities in children. Lead may be *the* most common drinking-water contaminant, affecting one in six households. Buy a treatment unit if tests reveal a lead concentration above 10 micrograms/L.

• **Trihalomethanes:** Trihalomethanes (THMs) form when chlorine, used for disinfection, reacts with decayed vegetation naturally present in the water. One familiar THM is chloroform; it and other THMs cause cancer in lab animals. If your utility draws its water from a river, lake, or reservoir, you will be exposed to THMs, especially during fall, when decayed vegetation abounds. What level of THMs is "safe" is a matter that the EPA is debating; current regulations require a total THM concentration less than 100 micrograms/L.

• **Nitrate:** Contamination with nitrate, a product of chemical fertilizers, is the most common reason for closing wells in agricultural areas. Its primary danger is to infants: It causes an illness called "blue-baby syndrome," which leads to suffocation. If you are hooked up to a large water utility, you're probably safe from nitrate, since most utilities are conscientious about nitrate testing. The EPA's "safe" limit on nitrate is 10 mg/L.

• **Radon:** Unlike many contaminants, radon is present in water through no fault of human endeavor; it's a naturally occurring radioactive gas formed from uranium. You are most at risk of radon exposure if your water source is a private well or small utility (serving fewer than 500 people) in Maine, New Hampshire, Connecticut, North Carolina, or Arizona. If your water comes from a surface source (river, lake, or reservoir), don't worry! The radon will escape into the air before the water reaches your tap. Radon is hazardous at concentrations above 10,000 picocuries/L.

• **Volatile organic compounds:** The term volatile organic compounds (VOCs) encompasses an array of chemicals used for varied purposes: as degreasers in industry, for dry cleaning, for household spot remover, for air freshener, even in food processing. VOCs migrate easily from dump sites, through the soil, into the groundwater. (Two VOCs caused the leukemia deaths in Woburn.) Although experts say that VOCs are not as prevalent in water supplies as lead, nitrate, THMs, and radon, episodes like Woburn show that the consequences of VOC contamination are serious. You're at risk of VOC exposure only if you drink groundwater; VOCs evaporate quickly from surface water. If a VOC shows up in your water, call the EPA's drinking-water hotline (see *Resources*, p. 34) to find out if the level is dangerous.

• **Pesticides:** If you live in an agricultural area, you're at risk of pesticide exposure. In Suffolk County, New York, for instance, a state survey documented that 2,000 private wells were contaminated with aldicarb. As with VOCs, call the EPA's drinking water hotline if tests uncover pesticides in your water.

That's what *might* be in your water, besides two Hs and an O.

Before you rush to the post office to mail your water samples, you can save money by requesting a copy of your municipal utility's water analysis. For example, the Montgomery County, Maryland, utility publishes a free list

Don't believe that your tap water is unsafe just because a salesperson in a lab coat tells you so.

of the contaminants they test for, along with the yearly average concentration of each, the maximum monthly average, and the EPA limit. Montgomery County's list shows that there are no pesticides in the water, so folks there needn't bother testing for pesticides.

There are two contaminants your utility cannot tell you about: lead and THMs. That's because lead leaches into your water on its way from the water treatment plant to your home. So, although the lead level may be zero at your water utility, the level at your tap could be hazardous. Likewise, THMs form en route to your tap, as chlorine combines slowly with invisible molecules from decayed vegetation.

THE UNITS THAT CURE

With luck (and probability) on your side, tests will show that your water is safe. If not, the cure is a system that's designed specifically to remove the contaminants that surfaced in the tests.

CAUTION: Research this purchase carefully, like you would the purchase of a car. Water-treatment devices aren't subject to EPA regulation, so quality control is a serious problem. Some shoddily manufactured units have little effect against pollutants. Others can *add* contaminants to your water. For example, glue in Norelco's "Clean Water Machine" leaked methylene chloride into water flowing through the system. Norelco, fully aware of the hazard, marketed the machine for five years, until a federal judge barred its further sale in 1988. Environmental engineers have documented similar problems with other filters: Some contain plastics that taint the water with VOCs; other contain residues of hazardous solvents.

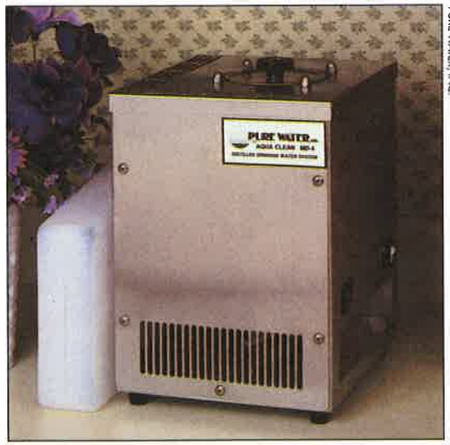
When shopping for a water-treatment system, your best guarantee against slipshod manufacturing is to buy a system that's been tested by an independent lab. One lab that certifies filter performance is the National Sanitation Foundation (NSF; see *Resources*). Consumers Union has also run tests.

Here are the four most common water-treatment systems, with descriptions of what contaminants each removes and the experts' recommendations for lab-tested brands:

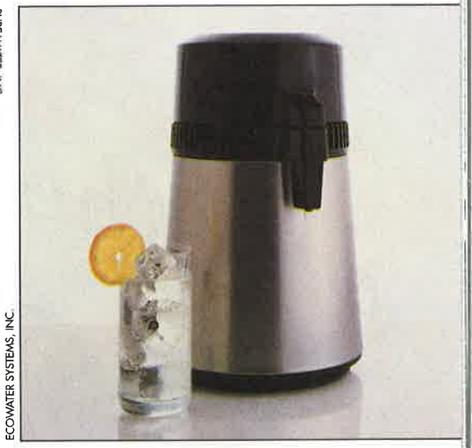
• CARBON FILTERS: Carbon filters are best for extracting THMs, VOCs, radon, and pesticides. They're powerless against lead, other metals, and nitrate. The active ingredient is "activated carbon," a charcoal-like substance with millions of pores to soak up chemicals. The more carbon the filter contains, the better. Faucet-mount filters are ineffective because they contain so little carbon; select a larger unit that mounts under the sink or sits on the counter.

When the carbon fills up with contaminants, you'll need to change the filter cartridge. There's no way to see when the carbon is full. A safe rule of thumb is to change the cartridge every couple of months, according to Dr. Vern Snoeyink, a University of Illinois professor who studies these systems. *Don't* believe manufacturers' claims that the carbon can last years, says Dr. Snoeyink.

A system whose performance both the NSF and Consumers Union have verified is the Amway E-9230, which retails for $200.



PURE WATER, INC.



ECOWATER SYSTEMS, INC.

Distillers remove lead and other metals, but they may not leave you with pure H_2O.

• REVERSE-OSMOSIS UNITS: Reverse-osmosis units are the best solution to lead and nitrate contamination. They remove *some* THMs, VOCs, and pesticides, but are useless against radon.

These devices contain coiled plastic sheets, called "semi-permeable membranes," which strain out contaminants. One drawback is that they waste water. Only 10 to 25 percent of the influent water passes through the strainer; the rest goes down the drain along with the contaminants.

One unit tested by both the NSF and Consumers Union is the Culligan Aqua-Cleer H-83, which hides under your sink; various versions retail for $600 to $1,000. Another is the countertop Shaklee BestWater System 50800, for $275.

• DISTILLERS: Distillers remove lead and other metals. They operate by boiling the water, then condensing the steam and dripping it into a jug. Anything that doesn't evaporate with the boiling water stays behind. Don't buy a distiller if your problem is VOCs, THMs, or radon; these volatilize along with the steam.

The major quality-control problem with distillers is that some corrode. Two that resist corrosion are the Aqua Clean Model 4 ($299) and the Sears 34555 ($150), both tested by Consumers Union.

• ION-EXCHANGE SOFTENERS: Water softeners, developed 60 years ago, are the oldest home water-treatment technology. Their primary function is not to eliminate health-threatening chemicals, but to remove harmless calcium and magnesium, which prevent soap from lathering and create scale in your teapot. Softeners can also intercept radioactive radium and barium, but *don't* let a salesman talk you into buying one to remove lead, VOCs, radon, or any of the other contaminants mentioned above.

According to Consumers Union, almost all softeners do the job they were designed for; choose one based on convenience and design. The average cost is $1,000.

FINAL WORDS OF ADVICE

For combinations of contaminants, your only solution may be to install both a carbon filter and a reverse-osmosis unit. For instance, if your water contains lead and THMs, you'll want reverse osmosis to take out the lead, and carbon to guarantee that no THMs escape. Also, both reverse-osmosis units and carbon filters work best if you install a sediment filter ahead of them to prevent clogging. Buy one at a plumbing store for about $40.

Remember: Don't believe your water is unsafe just because someone wearing a white coat knocks at your door and tells you so. Don't panic if your water coagulates when a saleswoman drops a chemical into it. And, please, don't buy your water filter from a telemarketer.

Federal Trade Commission attorney Jane Alcock, who's suing the telemarketer that defrauded Terry Hudson, says, "You wouldn't believe how many *really intelligent* people fall for this sort of thing." You wouldn't believe it — until it happens to you.

Jacqueline MacDonald is a freelance writer with a master's degree in environmental engineering. She lives in Silver Spring, Md.

WATER WORRIES? HERE'S HELP

LABS

These labs will send you a kit to collect tap-water samples that you mail back for analysis.

NATIONAL TESTING LABORATORIES, 6151 Wilson Mills Rd., Cleveland, OH 44143; (800) 458-3330. Cost is $89 for 73-item test that includes lead, nitrate, and THMs, or $119 for the above plus pesticides.

SUBURBAN WATER TESTING LABORATORIES, 4600 Kutztown Rd., Temple, PA 19560; (800) 433-6595. Standard test, for $98, includes nitrates, THMs, and VOCs. Add lead and radon for $148, total.

WATERTEST, 33 South Commercial St., Manchester, NH 03101; (800) 426-8378. Lead or radon test is $30. Call for prices of packages that include various VOCs, THMs, and pesticides.

RESOURCES

EPA HOTLINE

For answers to questions about contaminants, call (800) 426-4791.

NATIONAL SANITATION FOUNDATION

They test treatment units to verify the manufacturer's performance claims. Ask for the "listing book" of drinking-water treatment units. Their tests are exhaustive, but the list of approved products is somewhat technical and hard to read. NSF, 3475 Plymouth Rd., Ann Arbor, MI 48106; (313) 769-8010.

FIT TO DRINK?

A thorough review of Consumers Union's tests of water-treatment equipment. *Consumer Reports*, Jan. 1990, pp. 27-43. At your local library.

PRODUCTS

CARBON FILTERS: *Amway E-9230*, Amway Corp., 7575 E. Fulton Rd., Ada, MI 49355; (800) 544-7167. Call for name of local distributor. $200.

REVERSE-OSMOSIS SYSTEMS: *Culligan Aqua-Cleer H-83*, Culligan Co., 1 Culligan Parkway, Northbrook, IL 60062; (800) 792-0092. Call or see white pages for nearest distributor. $600 to $1,000, depending on installation.

Shaklee BestWater System, Shaklee Corp., 444 Market St., San Francisco, CA 94111; (800) SHAKLEE. Call to order. $275.

DISTILLERS: *Aqua Clean Model 4*, Pure Water, Inc., Box 83226, Lincoln, NE 68501; (800) 626-9174 to order, or (800) 842-5805 for dealers. $299.

Sears 34555. Call (800) 366-3000 to order from catalog.