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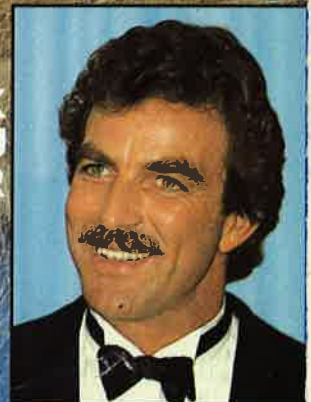


DOLLY'S COMEBACK: "I AIN'T DOWN YET!"

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TOM SELLECK INVITES YOU TO DINNER



CHARLES AND DI THE PAST THAT HAUNTS THEM



MEN WHO RAPE THE SHOCKING TRUTH, TERRIFYING STORIES



IS YOUR WATER SAFE TO DRINK?

(ARE YOU SURE?)



A SINGLE-CELL PARASITE FOUND IN TAP WATER (MAGNIFIED 2,400 TIMES)

"Our tap water is the only water my youngest child has ever had, and now they tell us it can cause cancer!" Sandy Engel's* voice is filled with anguish as she and her husband relate a story that sounds like a nightmare but is all too real. Sandy, 26, her husband Gordon, 27, and their two sons—Gordon Jr., 5, and Jimmy, 3—live in Atwater, a town of 21,000 in California's Central Valley. It's

*NAMES HAVE BEEN CHANGED TO PROTECT PRIVACY.

a quiet, friendly town, a good place to raise a family—or so they thought. Now Atwater's residents call their town "Bad Water."

The Engels' home sits not far from the runways of Castle Air Force Base. From the late 1940s through the 1970s, Air Force personnel reportedly had routinely dumped waste airplane fuel and dozens of other chemicals into disposal pits on the base. The chemicals included such known or suspected

carcinogens as trichloroethylene (TCE), toluene, benzene, xylene and carbon tetrachloride. The Air Force stopped using these waste dumps in 1979, and no one in Atwater thought much about them. But over the years, the cancer-causing substances seeped out of their underground storage sites and contaminated the wells that supply drinking water to 108 Atwater families, including the Engels.

"One day several years ago," Gordon

Contaminated water may cause liver and kidney damage, cancer, sterility, and mental retardation in children. And experts say that the water in thousands of American communities is, in fact, contaminated. They're calling it a national crisis. How does your water rate? What can you do to protect yourself?

Engel recalls, "an Air Force representative knocked on our door and told us we had to boil our drinking water because it was filled with carcinogens. We were shocked. We were advised to boil it with the windows wide open so we wouldn't inhale any dangerous chemical vapors. A month later, the Air Force told us not to drink our water at all, and began supplying us with bottled water. It was like going deeper into a nightmare."

"The hardest part is teaching the kids not to drink from the tap or the hose," Sandy says. "I tell them over and over again, but they're so young, they don't understand the danger. We get enough bottled water for drinking and cooking, but we have to bathe in the contaminated water. The Air Force says skin contact isn't dangerous, but I don't believe it. We all have itchy, flaky skin."

"One of our neighbors has cancer," Gordon says. "The Air Force says there's no proof the water caused it, but there's no proof it didn't, either. We worry about the children. They seem healthy, but all their lives they've been drinking a bunch of chemicals."

"We'd like to sell and move," he adds, "but who would buy a place with water you can't drink? We're stuck in Bad Water."

THE ALARMING TRUTH

Atwater is not the only U.S. town with contaminated water. One Florida community had to close its well after toxic chemicals were discovered in the water; the pollutants may have come from a nearby chemical plant. Recently, residents of a Montana lumber town had to drink bottled water because the local wells became contaminated with arsenic, a poisonous element used to treat wood—and a suspected carcinogen. In a New Jersey neighborhood, the problem stemmed from a leaky underground gasoline-storage tank: Now local kids get a kick out of setting glasses of tap water on fire. The alarming truth is that thousands of communities in more than 30 states have water-contamination problems—problems that have been linked not only to cancer, but also to intestinal disease, mental retardation and sterility.

"If you live near a military base, industrial factory, electronics plant, mine, airport, farmland or any kind of dump site, your water could be seriously contaminated," says investigative reporter Jonathan King, author of *Troubled Water* (Rodale, 1985), a study of the nation's water quality. "A 1983 Environmental Protection Agency (EPA) report on large public water systems found that more than twenty percent were contaminated. Water quality has become a national crisis."

TROUBLE UNDERGROUND

Mention "water" and most people think of reservoirs, streams, lakes and rivers. But these familiar sources of "surface water" make up only about 4 percent of the fresh water in the United States. The rest—96 percent of our existing water—is "groundwater." This is held in vast under-

ground reservoirs called aquifers, which are composed of porous layers of sand, rock and gravel. As the U.S. population has grown, more communities have sunk wells to tap into the extensive supply of groundwater. It is also used to irrigate food crops.

Until the 1970s, many experts believed that groundwater was immune to pollution because most groundwater reservoirs are located hundreds of feet below surface sources of hazardous chemicals. "But since the 1950s many underground tanks designed to store toxic chemicals have corroded, releasing enormous quantities of pollutants into the soil," King says. "Those chemicals percolate into the aquifers. It takes only a little groundwater pollution to contaminate a large water supply. A leak of a single gallon of gasoline a day can make well water for a community of 50,000 undrinkable for years."

Toxic chemicals exposed to sunlight decompose into less harmful substances—but this is not the case for pollutants underground. "The government knew for years that carcinogens like TCE were being dumped into waste sites," King says. "But no one got too upset, because in lakes and streams on the surface, TCE concentrations rarely reached more than a few parts per billion (ppb), which is not considered a health hazard. (If you dissolved one teaspoon of salt in an Olympic-size swimming pool, the water would contain one ppb salt.) But now we know that pollutants concentrate in groundwater aquifers. TCE groundwater concentrations have been measured at as high as 510,000—more than 3,000 times the highest level ever recorded on the surface."

The extent of contamination caused by industrial chemicals is difficult to comprehend. Consider this: About a dozen hazardous chemicals have been identified in the drinking water around Castle Air Force Base in Atwater—but these represent just a tiny fraction of the more than 60,000 toxic substances now used by U.S. manufacturing and mining industries. What's more, carcinogenic pesticides used on many food crops have contaminated thousands of water wells.

Industrial chemicals are not the only cause of the water contamination crisis. Some pollutants actually come from natural sources. For example, arsenic occurs naturally in certain minerals, so water flowing over rocks containing these minerals can pick up some of this dangerous poison. If it is not removed during water treatment, arsenic can cause severe liver and kidney damage.

Radon is another natural pollutant. Jeanne Briskin, special assistant to the director of the Environmental Protection Agency Office of Drinking Water in Washington, D.C., says, "Radon is a colorless, odorless, tasteless gas that occurs naturally in the ground, particularly in the Northeast and Southwest; under some circumstances it can enter the drinking water. Radon must be removed during treatment. If not, when the water is heated in cooking or agitated in a

BY MICHAEL CASTLEMAN

shower or washing machine, the gas vaporizes and becomes breathable. Inhaling radon increases the risk of lung cancer."

Infectious disease-bearing germs can also pollute water. Until the turn of the century, when water treatment facilities were established, waterborne diseases such as typhoid and cholera killed more than 25,000 Americans each year. But despite great advances in water treatment, microorganisms still pose a threat to our drinking water. One is giardia, a single-celled animal (protozoan) that can cause diarrhea, nausea, vomiting and cramps; symptoms may persist for months. Twenty thousand Americans have been infected with the parasite since 1972. Congress has recently required the EPA to set new standards for chlorination and filtration to reduce contamination by infectious diseases.

Fortunately, most pollutants can be removed during water treatment. But there's a catch: Water treatment itself can introduce carcinogens into the water. One example is chlorine, used for years as a disinfectant at water-treatment facilities. But scientists have discovered that chlorine can react with naturally occurring traces of plant matter in drinking water to form trihalomethanes (THMs). One THM, chloroform, is a carcinogen.

The bad news doesn't stop there. Even if water is perfectly safe to drink when it leaves the treatment plant, it may be hazardous by the time it reaches your tap. The reason: lead in water pipes. Homes built before 1930 often had solid lead pipes; most of today's copper pipes are connected with lead solder.

From 1962 until last year, the EPA allowed 50 ppb of lead in drinking water, but now it proposes reducing the allowable level significantly. "We estimate that 42 million Americans currently receive water with lead levels of more than 20 ppb," says the EPA's Jeanne Briskin. "More than 100,000 children may be suffering neurological and developmental problems because of lead in their water. For example, lead consumption can cause learning impairment and mental retardation. The latest research shows that even very low levels of lead ingested during pregnancy are associated with premature birth, slow mental and nervous system development and shorter stature."

HOW TO PROTECT YOURSELF

The first step in safeguarding you and your family is to find out the condition of the water flowing from your tap. Start by making inquiries at your local water department. The majority of U.S. water systems are regulated by the federal Safe Drinking Water Act (SDWA), which gives the EPA the authority to set exposure limits for everything in water that may pose a health hazard. Currently, the EPA has standards for bacteria; ten inorganic chemicals, including arsenic, lead and mercury; 15 organic chemicals (THMs and six agricultural pesticides); anything that releases radium; (continued on page 128)



Get off the stick. (And get off the cholesterol.)

If you've been watching your cholesterol count, count this: one tablespoon of butter has a whopping thirty milligrams of cholesterol. Butter Flavor PAM® cooking spray has zero. So get off the stick. Start cooking in Pam.

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pipes all night," Briskin says. "Let your water run at full force for a few minutes each morning to flush out any contamination. Lead and other metals also pass more easily into hot water than cold, so don't drink or cook with water from the hot water tap."

Bacteria and giardia can be killed by boiling water for 20 minutes or adding one drop of iodine per pint. Boiling also helps remove radon, gasoline and organic chemicals. Be sure to have good ventilation when you boil water; many contaminants boil off as gases that can be harmful if inhaled.

Home water filters. Tests by *Consumer Reports* and other independent investigators show that many home filters in the \$100 to \$300 price range remove bacteria, chlorine and other organic chemicals from water, but do not remove lead and other metallic elements such as arsenic. A home water filter's effectiveness depends on the type of activated charcoal (AC) it contains and how long the replaceable AC filter cartridge is used. Granulated AC is more effective than powdered AC, according to *Consumer Reports*. Be aware that, as a replaceable filter cartridge approaches the end of its rated lifetime, it stops removing contaminants and starts returning the collected pollutants to the water. Therefore, it's essential to change the AC filter cartridge regularly—preferably halfway through its lifetime as rated by the manufacturer. To maximize a filter's effectiveness:

- Let water run at full force for 30 seconds before first use each morning. After installing a new filter cartridge, run water for several minutes to remove loose particles of AC.
- Don't filter hot water; it can liberate contaminants from the filter and release them back into your water.

- Let water emerge from the tap slowly so it has more contact with the AC.

Bottled water. Sales of bottled water in the U.S. have tripled since 1976, reaching nearly \$2 billion annually. Bottled water comes in many different forms:

- Spring or natural water is obtained from a well or spring. It is usually disinfected to remove microorganisms, but may not be treated to remove other contaminants.

- Distilled, mineral-free or purified water contains minerals at less than ten parts per million. It may harbor minute amounts of non-mineral pollutants, such as pesticides.

- Mineral water is any water that contains minerals. There is no federal standard for mineral content, so most municipal tap waters could be bottled as "mineral water."

- Seltzer is usually tap water that has been carbonated by injecting carbon dioxide.

- Club soda is similar to seltzer, but minerals—including sodium—are added.

- Natural sparkling water contains enough naturally occurring carbon dioxide to make it bubbly. But gas dissipates when the water is taken from the ground, so carbon dioxide is usually reinjected during bottling.

Most bottled water comes from ground-water sources, despite the (continued)

IS YOUR WATER SAFE?

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total radioactivity. Water suppliers are supposed to conduct periodic tests to make sure regulated items are within safe limits. By law you should be able to get copies of test results.

Unfortunately, some water suppliers do not conduct the required tests. A 1982 survey by the Congressional General Accounting Office showed that 90 of 140 community water systems surveyed (out of 60,000 nationwide) did not test their water as required.

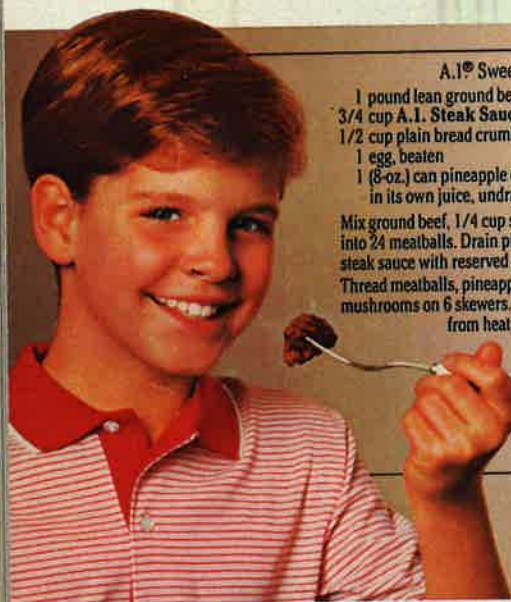
Even if your water supplier performs all required tests, your water still may be contaminated with pollutants the EPA does not

regulate. "We're in the process of setting standards for 83 contaminants," Briskin says. "Once these new limits are finalized by 1989, we'll have standards for nearly all the common drinking-water contaminants."

A word of caution: Tests conducted by water suppliers often are performed at treatment facilities. But your water may become contaminated with lead in your own home plumbing. The only way to know for certain what's in your water is to have it tested from your own tap. A number of laboratories around the country test tap water for lead and other contaminants (see "Test Your Water," page 130). If tests show contamination problems, consumers have these options: **Quick fixes.** These help to eliminate lead and microorganisms. "Lead levels are highest in the morning because the water sat in



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A.I.[®] Sweet and Sour Kabobs

- | | |
|--------------------------------|---------------------------|
| 1 pound lean ground beef | 1 medium green pepper, |
| 3/4 cup A.I. Steak Sauce | cut in squares |
| 1/2 cup plain bread crumbs | 6 cherry tomatoes, halved |
| 1 egg, beaten | 6 fresh mushrooms, halved |
| 1 (8-oz.) can pineapple chunks | Hot cooked rice |
| in its own juice, undrained | |

Mix ground beef, 1/4 cup steak sauce, bread crumbs and egg; shape into 24 meatballs. Drain pineapple, reserving juice. Mix remaining steak sauce with reserved juice. Set aside.

Thread meatballs, pineapple, green pepper, cherry tomatoes and mushrooms on 6 skewers. Grill or broil kabobs 4 to 6 inches from heat source for 10 to 15 minutes or until done, turning and brushing with steak sauce mixture frequently. Serve with rice. Makes 6 servings.

A.I. makes hamburgers taste like steakhamburgers!
(Imagine what it can do for all your beef recipes.)



IS YOUR WATER SAFE

continued from page 128

groundwater pollution crisis. Some recent findings:

- In 1988 the Suffolk County, New York Department of Health Services tested 93 brands of bottled water. None contained hazardous levels of bacteria, but several exceeded EPA limits for dichlorobenzene, manganese, THMs, toluene and trichloroethylene.
- A 1985 report by the California Department of Health Services found several bottled waters contaminated with toluene, xylene, phenol, mercury, nitrates, trichloroethylene, benzene, arsenic and chloroform. A bottler was ordered to withdraw his product.
- *Consumer Reports* recently tested 50 bottled waters. None had any detectable bacteria, lead, mercury, barium or cadmium, but a few were contaminated with arsenic, THM and tetrachloroethylene.

If you're concerned about the bottled water you drink, ask the manufacturer for results of recent tests, or ask your local or state health department if it has tested the water. Or send a sample to a testing laboratory.

"Most authorities say that bottled water is generally of good quality," King says, "but the bottom line is that some brands may be as clean as some tap waters."

CLEANING UP OUR ACT

By 1991 the Safe Drinking Water Act scheduled to increase the number of regulated contaminants from 20 to 83; it will also require stricter disinfection. Other measures such as the use of lead-free pipes and solder should also help reduce our dangerously high levels of water contamination. The introduction of unleaded gasoline in 1975 has already had a beneficial effect: "The level of lead in the average American's blood has dropped dramatically since the mid-1970s," says Jeanne Briskin.

Meanwhile, work is under way to clean up the water in certain communities with contamination problems. For example, the Air Force has allocated funds to drill a new well to supply those residents of Atwater who live near old wells that were contaminated by the dump at Castle Air Force Base. The new well should be completed this November. Studies are also in progress to determine the best method of cleaning up the contaminated groundwater in this town. The method to be selected by 1991; however, the cleanup probably will take 15 to 20 years.

It's going to take many years before our drinking water is safe from contamination. Meanwhile, each of us must take responsibility for the safety of our own drinking water. Is your water safe to drink?

Michael Castleman, author of *Cold War* (Ballantine, 1987), is editor of *Medical Care* magazine in Point Reyes, California.

TEST YOUR WATER

To have your water analyzed for contaminants, contact a water-testing laboratory. Along with specific instructions on how to take the samples, you will receive containers to be filled with water. The lab then tests the water for pollutants. You then receive a written analysis of your water, and suggestions on ways to improve its quality. A test for lead alone costs approximately \$30; average price of more complete analysis is \$100.

Below, three laboratories that specialize in testing drinking water. There are others—check your local phone book.

- National Testing Laboratories, 6151 Wilson Mills Rd., Cleveland, OH 44143; 800-458-3330 (in Ohio, 216-449-2525.)

- Suburban Water Testing, 4600 Kutztown Rd., Temple, PA 19560; 800-433-6595 (in Pennsylvania, 800-525-6464).
- WaterTest, 33 S. Commercial St., Manchester, NH 03101; 800-426-8378.

For a free booklet, write to "Lead and Your Drinking Water," U.S. Environmental Protection Agency, WH-550, Washington, DC 20460.

An eight-page pamphlet published by *The Buyer's Market* offers information on contamination, testing and home treatment of water. Send a self-addressed, stamped business-size envelope and \$1 to: The Buyer's Market, Drinking Water, P.O. Box 19367, Washington, DC 20036.