When we think of water pollution, we usually visualize sewage or industrial effluents pouring out of a discharge pipe, but there are natural toxins that threaten us as well. One of these is arsenic, a common contaminant in drinking water that may be poisoning millions of people around the world. Arsenic has been known since the fourth century B.C. to be a potent poison. It has been used for centuries as a rodenticide, insecticide, and weed killer, as well as a way of assassinating enemies. Because it isn't metabolized or excreted from the body, arsenic accumulates in hair and fingernails, where it can be detected long after death. Napoleon Bonaparte was found recently to have high enough levels of arsenic in his body to suggest he was poisoned.

Perhaps the largest population to be threatened by naturally occurring groundwater contamination by arsenic is in West Bengal, India, and adjacent areas of Bangladesh. Arsenic, in the form of insoluble salts, occurs naturally in the bedrock that underlies much of this region. Under normal conditions, the groundwater stays relatively free of arsenic in a soluble form. Rapid population growth, industrialization, and intensification of agricultural irrigation, however, have put increasing stresses on the limited surface water supplies of this region. Groundwater has all but replaced other water sources for most people in West Bengal, especially in the dry season.

In the 1960s, thousands of deep tube wells were sunk throughout the region to improve water supplies. Much of this humanitarian effort was financed by loans from the world bank in the name of human development. At first, villagers were suspicious of well water, regarding it as unnatural and possibly evil. But as surface water supplies diminished, dusty Bengali villages became more and more dependent on this new source of supposedly fresh, clean water. By the late 1980s, health workers became aware of widespread signs of chronic arsenic poisoning among villagers in both India and Bangladesh. Symptoms of chronic arsenicosis include watery and inflamed eyes, gastrointestinal cramps, gradual loss of strength, scaly skin and skin tumors, anemia, confusion, and, eventually, death.

Why is arsenic poisoning appearing now? Part of the reason is increased dependence on well water, but some villages have had wells for centuries with no problem. One theory is that excessive withdrawals now lower the water table during the dry season, exposing arsenic-bearing rocks to air, which converts normally insoluble salts to soluble oxides. When aquifers are refilled during the next rainy season, dissolved arsenic can be pumped out. Health workers estimate that the total number of potential victims in India and Bangladesh may exceed 200 million people. But with no other source of easily accessible or affordable water, few of the poorest people have much choice. Although few places in North America have as high groundwater arsenic content as West Bengal, there are worries that millions of Americans also are exposed to dangerously high levels of this toxic element. In 1942, the U.S. Government set the acceptable level of arsenic in drinking water at 50 micrograms per liter (50 parts per billion or ppb). Although this standard was set before the connection between arsenic and cancer was understood, it has never been revised. Recent studies suggest that the risks of certain kinds of cancer from a lifetime of drinking water with 50 ppb of arsenic may be as high as 1 in 100, or 10,000 times the normally accepted threshold for acceptable risk. Repeated attempts to lower the standard to 10 ppb have been met with resistance from public officials and private water supply owners, who complain that it would cost too much to upgrade their systems. The government has no business, they maintain, in telling us what we can or cannot drink.

**Ethical Considerations**

What do you think? If you choose to drink water that gives you a 1 in 100 chance of cancer, is that your business or does the government have a right (or obligation) to stop you? Is it ethical to allow customers of water districts to be exposed to a poison that they know nothing about? Would it be enough
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to require public systems to inform their customers of the risks involved? Would your parents or friends understand the implications of 1 in 100 risk of cancer? Do they smoke? What could be done to help the hundreds of millions of people in India and Bangladesh who now drink contaminated water? Is it our responsibility? What if it was our money that installed the tube wells in the first place? Does that change the picture?