

Water chlorination under attack

The anti-science mob has created another cancer scare which poses a severe public health threat. Cal Valentine reports.

During 1992, environmentalists launched another scare campaign, alleging that chlorinated drinking water could cause cancer.

On April 15, the International Joint Commission, a binational governmental body which addresses U.S.-Canadian border issues, especially the monitoring of water and air quality in the Great Lakes basin, recommended that chlorine and chlorinated compounds be phased out in the Great Lakes region.

On May 21, a short news item appeared on the database network Econet about an interview with Adam Trombly, co-director of the Institute for Advanced Studies at Aspen, Colorado and co-founder of Project Earth. Trombly was quoted as saying that because the depletion of the ozone layer is so advanced, we need "an emergency worldwide shutdown of all chlorine production except for pharmaceutical uses. . . ." Trombly blames the entire halogen family of elements as the destroyers of ozone, and claims that the principal agents of depletion are not chlorofluorocarbons (CFCs) used for refrigeration among other things, but rather are the chlorine ions "evaporating from swimming pools, water-treatment plants, sewage-treatment plants, and bleaches." He also complains that "citizens don't yet understand that we must declare a worldwide emergency involving various military forces and whatever is available. We have got to get excited. . . ."

An article appeared in the July 1992 issue of the *American Journal of Public Health* that had previously been submitted to and rejected by *Science*, the *Journal of the American Medical Association*, and even by the *American Journal of Public Health*, under a different editor. The article was a report on a new analysis of old studies of the association between water chlorination by-products and cancer. Ten studies with contradictory findings were selected and analyzed by a relatively new computer technique called a "meta-analysis," with supposedly greater statistical accuracy. The results of this "meta-analysis" suggested a positive association between consumption of chlorination by-products in drinking water and bladder and rectal cancer in humans.

This was heralded by the Washington Post on July 1 in an article trumpeting "Chlorinated Drinking Water Found to Raise Cancer Risk." The *New York Times* carried a more modest heading: "Tiny Cancer Risk in Chlorinated Water."

The chlorination scare—irrespective of a ban—has further encouraged the flight into faddish purchases of home water purification devices to protect themselves from the perceived risks of drinking tap water. Those who have invested in this market stand to reap huge profits, at least in the short term. The Water Quality Association, a trade organization representing manufacturers of water purifiers, reports that sales rose 35% per year in 1987 and 1988. Nearly 2 million water purifiers were sold in 1988 alone. However, the Tufts University *Diet and Nutrition Letter* of May 1992 pointed out that there is no regulation of home water purification devices, and cited a rising number of claims for fraud and unethical sales practices.

Chlorination saved millions

For anyone to demand the abolition of what some have considered the single most important public health measure in history is to completely despise the lives saved by chlorination.

In 1900 the average typhoid fever rate was 360 per 1,000,000 U.S. population, which resulted in more than 25,000 deaths. Since the advent of chlorination, the typhoid fever and death rates have dropped precipitously. In 1989, the Centers for Disease Control in Atlanta, Georgia, reported a typhoid fever rate of 2 per 1,000,000 U.S. population.

The CDC, in cooperation with the Environmental Protection Agency (EPA) and state and local health agencies, provides a surveillance system to monitor outbreaks of waterborne diseases. CDC reports for 1971 through 1988 describe deficiencies in disinfection practices leading 545 outbreaks of waterborne disease afflicting almost 137,000 persons. Some 15 outbreaks affecting more than 21,000 people occurred in the United States in 1987 alone.

Two key deficiencies were identified: 1) disinfection was not provided where needed, and 2) where it was provided, disinfection equipment was not operated properly. It is reasonable to conclude that serious outbreaks of waterborne disease will recur unless proper disinfectant residual is maintained.

Media push death by panic

On July 7, the environmental policy analyst Jonathan Adler attacked the *Washington Post's* sensationalism in an

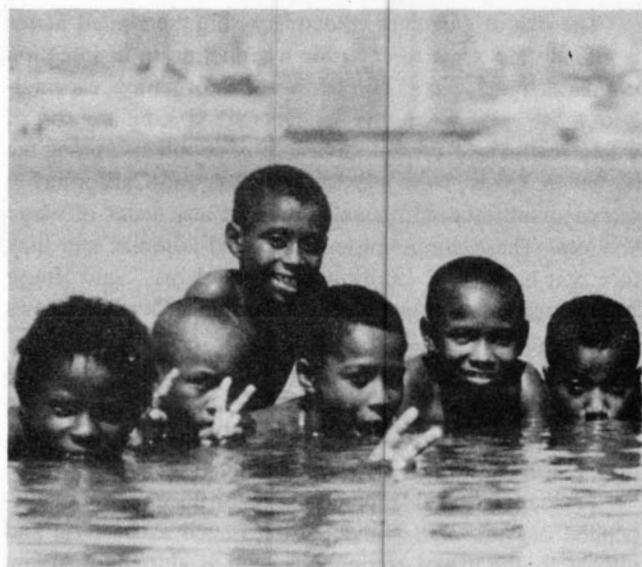
article in the *Washington Times*, "Toxic Journalism Strikes Again!" Adler pointed out a basic flaw in environmental journalism that stresses the negatives and ignores the positives of any technology and, in particular, any life-saving or life-extending technology.

Dr. Thomas C. Chalmers, who co-authored the article that appeared in the *American Journal of Public Health* revealed why the authors found it so important to "inform" the public about computer meta-analysis that chlorination posed a cancer threat. He was quoted in the *New York Times* as saying that the scientific journal experts who rejected the paper for publication "were uneasy about informing people about this problem until some alternative was available," for fear that people would demand an end to chlorinating water. "But we felt people ought to have the data, not suppress it," Dr. Chalmers said. His statement suggests that their research has been accepted as proof that chlorination causes cancer and that the paper was rejected for pragmatic reasons. In fact, the International Agency for Research on Cancer (IARC) reviewed the studies used in his and his associates' analysis and considered these studies inadequate for determining the carcinogenicity of chlorinated drinking water in humans.

The EPA currently supports the IARC conclusions. Responding to the article by Chalmers et al., the EPA released a fact sheet in July, saying that "although a positive association was reported, this study does not demonstrate a causal association between chlorinated drinking water and cancer. . . . In addition, the EPA continues to support the disinfection of drinking water for the purpose of reducing the risk of waterborne disease. The known risk of waterborne disease in humans that occurs if water is not disinfected is much greater than the theoretical risk of developing cancer from the consumption of chlorinated drinking water."

In a *Washington Times* article, Jonathan Adler reported that "a peer-reviewed 1987 study of relative cancer risks published in *Science* estimated that the cancer risk from one liter of tap water is one-thirtieth that from a serving of peanut butter," referring to the fact that peanuts contain the carcinogen aflatoxin. Moreover, the authors of the *American Journal of Public Health* study neglected to "inform the public" why they considered the cancer risk from chlorinated drinking water to be greater now, when some of their data came from studies that pre-dated the 1979 EPA regulations of 0.1 milligram per liter. The limit was set by EPA in order to control one group of suspected cancer-causing by-products, called trihalomethanes (THMs). How could a *reduction* in the suspect THMs result in an *increase* in cancer risk?

Dr. Hugh Elsaesser, an atmospheric scientist, commented on this reporting technique in a recent press conference given on the occasion of the publication of the book, *The Holes in the Ozone Scare*. He said that the method was "a very familiar process; looking at an issue through a one-way filter. First, you ignore any possible benefits and then you exaggerate all those things that are detrimental."



Angolan children playing in the river in Luanda. Chlorinating water for human consumption is the most basic public health measure that has reduced deaths from waterborne diseases dramatically. The anti-science mob has raised a hue and cry over an alleged cancer threat from chlorinated water, as part of their campaign for zero growth.

Cholera in South America

The *New York Times* article did report that the new published analysis "comes at a time when previously reported studies have suggested that existing American chlorination levels are too low to prevent many cases of gastrointestinal illness. Experts have warned that if chlorination standards are relaxed in the United States, areas of the country could experience epidemics of cholera and other diseases. Such epidemics have occurred recently in areas of South America where chlorination was stopped or standards lowered, the experts said."

Jonathan Adler, in the *Washington Times*, commented on the South American epidemic: "That attempt to avoid small risks of cancer can have disastrous consequences has been aptly demonstrated by the recent cholera outbreak in Latin America that has resulted in more than 300,000 reported cases, and more than 3,500 deaths so far. Health experts believe the outbreak resulted from the decision of Peruvian health officials to stop chlorinating the Peruvian water supply. The decision was prompted, in part, by the release of EPA studies detailing chlorine's potential to cause cancer. The resulting cholera outbreak swept through Latin America, from Guatemala to Brazil, and even prompted fears of cholera incidence at the Earth Summit in Rio. In what was ostensibly an attempt to eliminate one risk, a much greater risk was unleashed.

"Before Peru's decision, there had not been a major outbreak of cholera since 1973 when sewage was inadvertently discharged into the Bay of Naples."

The risk of a cholera epidemic within the United States is already too great to entertain a reduction in disinfection standards, much less an elimination of chlorination, especially in those areas where the residents are lacking any sort of water treatment. "Tens of thousands of people live along the border in Texas, New Mexico, Arizona and California, in crowded substandard housing, without any water or waste services. These communities are called colonias and they face real health and environmental problems," said House Agriculture Committee Chairman Kika de la Garza in a news release in July.

Water treatment procedures

Water treatment usually consists of four steps: coagulation, clarification, filtration, and disinfection.

1) Coagulation: The precipitation or flocculation of suspended organic matter and particles such as bacteria and viruses by the use of compounds such as aluminum sulfate or ferric sulfate. These are reported as being effective in

removing bacteria and more than 99% of viruses.

2) Clarification: The separation of the precipitated solids from the liquid.

3) Filtration: Removes any remaining suspended solids and bacteria. The two most common filter materials are diatomaceous earth and rapid sand.

4) Disinfection: Involves the addition of chlorine, often in the form of hypochlorous acid. Chlorine gas is most economical and easiest to apply in large systems. For small works, calcium hypochlorite or sodium hypochlorite is used. The amount depends on the quantity of organic matter in the water that will antagonize the halogen. It is usual to aim for 0.1-0.8 milligram per liter of free chlorine in the water after treatment. Chlorine will affect most viruses and bacteria but not protozoan cysts or some bacterial endospores.

The level of by-products formed by the addition of chlorine to water can be reduced by using chlorine compounds with small quantities of ammonia added. This process, called chloramination, is as effective a disinfectant if the exposure

Pope issues appeal to avert water catastrophe

The following are portions of Pope John Paul II's message for Lent 1993, titled "I Thirst," which was issued by the Vatican on Sept. 18, 1992.

Regarding the root causes of desertification and pollution, the Jan. 1, 1993 special issue of EIR on "The Rebirth of Africa" documents the nefarious role of International Monetary Fund debt collection, as the main culprit for enforcing backwardness in the world. The articles on pages 69-74 of that issue outline the kinds of water management projects needed to "make the deserts bloom."

. . . During Lent of 1993, in order to practice in a concrete way the solidarity and fraternal charity associated with the spiritual quest of this special season of the year, I ask the members of the Church to remember particularly the men and women suffering from the tragic desertification of their lands, and those who in too many parts of the world are lacking that basic yet vital good which is water.

Today we are concerned to see the desert expanding to lands which only yesterday were prosperous and fertile. We cannot forget that in many cases man himself has been the cause of the barrenness of lands which have become desert, just as he has caused the pollution of formerly clean waters. When people do not respect the goods of the earth, when they abuse them, they act unjustly, even criminally, because for many of their brothers and sisters

their actions result in poverty and death.

We are deeply worried to see that entire peoples, millions of human beings, have been reduced to destitution and are suffering from hunger and disease because they lack drinking water. In fact, hunger and many diseases are closely linked to drought and water pollution. In places where rain is rare or the sources of water dry up, life becomes more fragile; it fades away to the point of disappearing. Immense areas of Africa are experiencing this scourge, but it is also present in certain areas of Latin America and Australia.

Furthermore, it is quite clear to everyone that uncontrolled industrial development and the use of technologies which disrupt the balance of nature have caused serious damage to the environment and caused grave disasters. We are running the risk of leaving as our heritage to future generations the tragedy of thirst and desertification in many parts of the world.

I earnestly invite you to give generous support to the institutions, organizations, and social agencies which are trying to help peoples suffering from shortages or drought and experiencing difficulties of increasing desertification. I likewise urge you to cooperate with those engaged in scientific analysis of all the causes of desertification and in the quest for solutions to this problem.

May the active generosity of the sons and daughters of the Church, and of all men and women of good will, hasten the fulfillment of the prophecy of Isaiah: "For waters shall break forth in the wilderness, and streams in the desert; the burning sand shall become a pool, and the thirsty ground springs of water" (Is 35:6-7)!

time is increased but is less reactive with organic contaminants thereby reducing the level of trihalomethane by-products such as chloroform that are suspected to be carcinogens. Chloramination is currently being used in 20% of the major water treatment systems in the United States.

Are there any viable alternatives to using chlorine-based disinfection processes? Both ozone and ultraviolet radiation are effective disinfectants, yet they are more expensive and, most importantly, afford no residual protection in case of contamination of the water supplies downstream of the water treatment facilities.

History of water chlorination

According to a paper from the Chlorine Institute, "Exceeding All Expectations: A Short History of Chlorination,"

"The purification of drinking water through chlorination has its roots well over a century ago, for the earliest printed reference to it appears in an 1835 book, *Human Health*, by a Philadelphia physician named Robley Dunglison. To make 'the water of marshes potable,' he stated, 'it has been proposed to add a small quantity of chlorine or one of the chlorides.'

"The first city to chlorinate its entire water supply was Maidstone, England, where hypochlorite bleaching powder was so used in 1897. Ostend and Middlekerke, Belgium, followed in 1900 and 1902, respectively. Lincoln, England, began chlorination during 1905, but perhaps most significant was the adoption at the Boonton, New Jersey, reservoir in 1908. Up to this time the total amount of water chlorinated was relatively small, but the Boonton facility delivered 40 million gallons of water each day to Jersey City. Within three years, over 800 million gallons of water were being treated daily—in such cities as New York, Philadelphia, Baltimore, St. Louis, Kansas City, Montreal and Ottawa.

"The second use of chlorine itself, and the first to involve liquid chlorine as a source material, was supervised by Major C.R. Darnall of the U.S. Army Medical Corps at Fort Myer, Virginia, during 1910—less than a year after liquid chlorine was first produced in the United States. Further tests were conducted at Philadelphia in September, 1912, and the first full-scale tryout came later that year at Niagara Falls, New York, under the direction of Dr. Georg Ornstein, while the city was undergoing a typhoid epidemic.

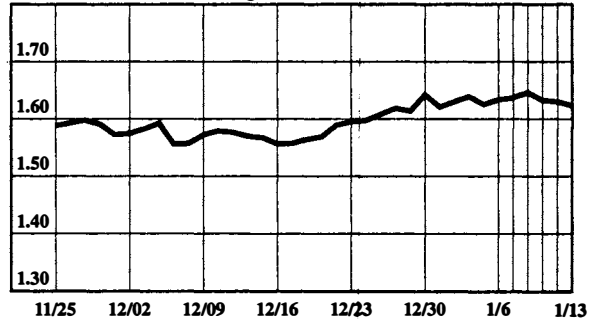
"The first permanent chlorinator to use liquid chlorine was erected in Philadelphia in 1913. The process was so convenient that by the end of World War I, well over three billion gallons of water were being treated each day in more than a thousand North American cities."

Until a replacement can be found that has a residual capacity to disinfect our drinking water, it would be hazardous to eliminate chlorine-based compounds in our public water treatment systems. It is important that people who are less able to afford medical treatment are not placed in greater risk of contracting waterborne diseases.

Currency Rates

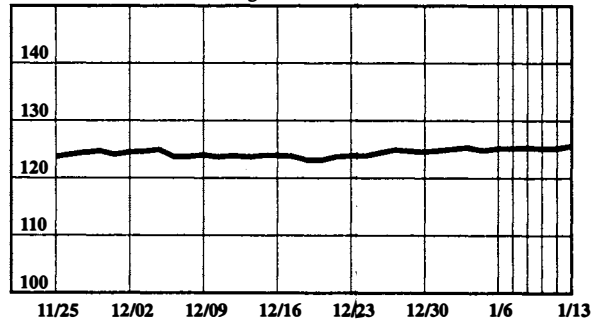
The dollar in deutschemarks

New York late afternoon fixing



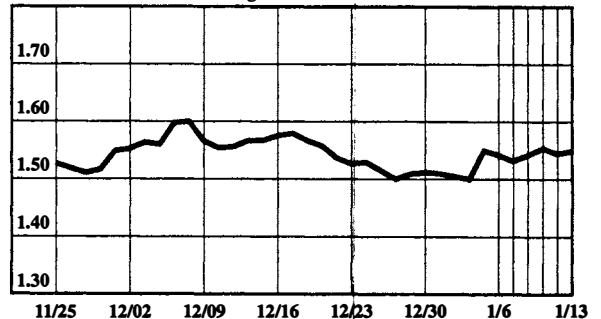
The dollar in yen

New York late afternoon fixing



The British pound in dollars

New York late afternoon fixing



The dollar in Swiss francs

New York late afternoon fixing

