In the words of Carl Sagan: "We've arranged a global civilization in which most critical elements depend on science and technology. We have also arranged things so that almost no one understands science and technology. This is a prescription for disaster."

The combination of a scientifically unsophisticated public and the profusion of easily accessible crackpot information on the Internet is indeed a prescription for disaster. Bogus issues ignite the paranoia of some people searching for a "meaningful" cause, and the results can be medical disaster. (As an example, the groundless hysteria about mercury in vaccines may put us all at risk of epidemics: already diseases that had been long under control are beginning to resurface.)

And now another old quack cause is being recharged: the anti-fluoridation movement. An article in *Time* (Oct. 24) sympathetically describes this burgeoning new/old crusade and, by getting many things wrong, adds fuel to the fire.

Historically, anti-fluoride activists have claimed, with no evidence, that fluoridation causes everything from cancer to mental disease. It was even called a Communist plot to poison our wells -- until the Russians fluoridated their own water. Typical of quack tactics, when one phony claim was disproved they came up with another. Activists claim their activity is based on "research." But looking up blogs on Google is not research: the Internet is too often a source of hysteria and paranoia rather than sound science.

The facts are clear: fluoride, one of Earth's most abundant elements, is a mineral found naturally in many water supplies. Low dosages of ingested fluoride will cause developing teeth to greatly increase their resistance to decay. Fluoridation of community water supplies is the most extensively investigated public health measure in history. Entire populations have been studied, and there is not a shred of bona fide evidence that anyone has been harmed by proper fluoridation of community water supplies. Fluoridation is widely considered one of the century's great public health achievements. The American Dental Association lists 114 prominent national and international health organizations that support fluoridation.

The poorly-informed *Time* article suggests that fluoride in the water is not necessary because we get it in toothpaste. Toothpaste is "a more efficient way to get the decay-fighting ingredient where it is needed and nowhere else" says *Time*. But while fluoride in toothpaste is indeed effective, fluoride in the water supply provides a considerable additional anti-caries effect.

*Time* says "with the spread of fluoride toothpastes and the use of plastic sealants by dentists, decay has plummeted even in regions where there is little or no fluoride in the water." When water fluoridation was introduced in 1945, the demonstrated reduction in caries over the control population was in the area of 65%. Today, the difference between fluoridated and non-fluoridated
areas is "only" around 25%. But the decay rate has "plummeted" mostly because of the ubiquity of fluoride in the country's water supply. Sealants don't protect against common between-teeth decay, and since most of the country is fluoridated, a person in a non-fluoridated area eating a canned peach or drinking a soda will likely receive some fluoride. Just a small amount of fluoride will enhance resistance to decay.

*Time* says, "The most recent -- and controversial -- charge links fluoridation with bone cancer." This "most recent" allegation goes back to the unauthorized release of preliminary data from a 1990 study, data that was subsequently discredited by the U.S. Public Health Service. More recent studies do not demonstrate a cancer-fluoride connection.

*Time* cites the Environmental Working Group (EWG) as a "watchdog organization." This lends credence to EWG's anti-fluoride stance. But EWG has been criticized as an outfit that promotes propaganda rather than science and ignores the principle that "only the dose makes the poison." The ACSH publication *Good Stories, Bad Science* gives two recent examples of EWG's wrong-headed conclusions: the issues of pressure-treated wood and farmed salmon; the latest example is anti-fluoridation.

*Time* quotes an activist: "Why would I want to put a toxic industrial chemical in my children's bodies?" The public would have been better served had the reporter noted that only the dose makes the poison and that fluoride in community water supplies is not at all toxic. Of course, in high dosage fluoride is toxic, as is most everything. But in low dosage fluoride is an essential element for the developing individual.

*Time* cites a thesis from a doctoral student that shows a sevenfold increase in osteosarcoma from fluoridated water. But this is a lone student-researcher's study that has never been published or subject to peer review. Indeed, the student notes in her thesis that there are several limitations to her study and recommends that the findings be confirmed using data from other studies. For example, she notes that the study may not accurately reflect the actual amount of fluoride consumed by study subjects. *Time* should have mentioned this.

*Time* talks about the cosmetic hazard of "mottled" teeth caused by fluoride and claims that 32% of American children have some form of mottling. To me, this is puzzling: New York City fluoridated its water in the 1960s and since then, as a practicing dentist with hundreds of New York children as patients, I almost never noticed any youngsters with mottled teeth. I suspect that the 32% figure mostly represents slight mottling that is not visible.

Early in my dental career I saw many children with "bombed out" mouths, mouths with heavy decay in most every tooth. But once the fluoridation program was established, I rarely saw decay at all in children. One disturbing exception: a woman brought in a child ridden with decay. I explored the usual suspects: bottle with milk or juice at night, excess candy consumption, poor diet, poor oral hygiene, did she come from a non-fluoridated area? She answered no to all. "I can't understand it," she said. "We are very health conscious and only use bottled water!"
Time says "the risks of water fluoridation are hotly debated." I say, science is to be preferred to heat. Consumer's Union put it well some years ago: "The survival of this fake controversy represents one of the major triumphs of quackery over science in our generation."

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