

# Fluoride and Lead

by  
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All of the fluoride products used in the artificial fluoridation of water are contaminated with lead and arsenic. (We received the evidence from Margaret Stasikowski, an official with the EPA, in the form of copies of pages from Water Chemicals Codex, National Academy Press, Washington, DC, 1982.)

The lead contamination is considered the most serious so we'll deal with that one rather than with both substances. Lead is creating the most concern today we'll go into the arsenic angle in a later paper.

So How does the tainting occur? In the matter of the fluosilicates (such as hydrofluosilicic acid); the most commonly used fluoride substances in community water systems, this is the story:

The fluosilicates are the by-products of the phosphate fertilizer industry. In the manufacture of this kind of fertilizer, phosphorus is obtained from phosphate rock, which has to be broken down with sulfuric acid.(1) Fluorine occurs naturally in combination with the phosphates.(2) In these two facts lie the keys to the presence of lead in the fluosilicates.

Step One: Sulfuric acid is prepared by either of two ways, the lead chamber process(3) or the contact method.(4) In its purest form (made by the contact method) it is used in pharmaceuticals; in its lowest grade (produced by the lead chamber process) it is used by the fertilizer industry.(5) It is also frequently recovered for re-use, but this form is too impure for any purpose except the manufacture of fertilizer, for which it is quite suitable.(6)

In the lead chamber process purification is carried out only to the extent of removing substances that could clog the machinery.(7) Of the common metals, only lead is resistant to cold sulfuric acid in concentrations up to 100%. But in hot acid the resistance is up to about 70%.(8) The lead chamber type uses heat (about 600 C) and isn't cooled during the process. That's why a certain amount of lead is leached during this procedure.

If a pure product is needed, the contact method is used, but it's more expensive, more complicated. In the making of fertilizer, however, a pure grade is not necessary. After all, neither fertilizer nor its by-products were intended for human consumption.

Step Two: Fluorine, which is a highly reactive element capable of joining with any other element except oxygen, is able to leach lead from the contaminated sulfuric acid. In the past hydrofluosilicic acid was simply neutralized and discarded. The picking up of lead wouldn't have been a problem. But eventually it was decided that the acid, being already in solution, would be better, simpler to use, and less expensive than sodium fluoride.(9) The lead contamination, apparently, was forgotten (if, indeed, it had ever been noticed.)

Sodium fluoride is also lead-tainted (and with arsenic, as well.) Aluminum ore (bauxite) is usually

contaminated with lead and arsenic (and a number of other elements.) In order to obtain a pure product, these have to be removed.(10) They become part of the major by-product of aluminum refining, sodium fluoride.

Another way in which fluoridation contributes to lead in the water is through its action on whatever lead pipes may still be in existence in older homes. Any lead pipes would be old lead. These are ordinarily covered by a protective coating made by the lead itself which is impervious to diluted acids (as all of them would be in water.) Water acts slowly on lead, forming lead hydroxide, but the action is slight if the water contains carbon dioxide or carbonates or sulfates which interact with lead to form these protective coatings.(11) It's interesting that the lead pipes in Roman aqueducts, 2000 years old, are still in such good shape the numbers and letters engraved on them are clearly legible.(12)

In fluoridated water, though, it's a different matter. Fluorine can and does destroy the protective coatings; it can and does leach lead.

A pediatrics textbook published in 1964 (13) noted that the incidence of lead poisoning had been rising in certain metropolitan areas in Eastern United States. The blame was laid on old lead paint flaking from walls and woodwork. But most of the lead chips were old before 1964; some children chewed them long before then. But a new source of lead had arisen--unnoticed: The fluoridation of water, with lead-contaminated fluoride, a substance also capable of leaching lead from the pipes. Although there were scattered places fluoridating throughout the nation, larger numbers of eastern metropolitan communities were doing so.

Today one in nine children under the age of six is said to have unacceptably high blood lead levels (14) even though lead paint was banned in 1978 (and hadn't been used extensively since the 1950's!) Lead in gasoline has been phased out, and lead solder hasn't been permitted on copper tubing since 1986 (eight years ago.) The EPA says that lead stabilizes in five years. So except for fluoride use, any pipes, whether of lead or lead-soldered, should not now be hazardous. The most revealing statistics, though, are the high blood lead levels in 400,000 newborns each year. Newsweek in its article on lead and the threat to children (15) said that pregnant women passed this toxic substance to their unborn children by eating, drinking, or breathing it. But even though pregnant women do sometimes have weird cravings, it's not likely more than a tiny percentage would be chewing paint chips, nor would a significant number of them be engaged in renovating old houses. The lead is in the water--and in foods and beverages prepared with the water.

The EPA estimates that 10-20% of the lead in children comes from the water.(16) That agency, which knows of the lead contamination of fluoride products, insists the amount is too small to be of regulatory concern. What they have overlooked, though, is that it concentrates in the body tissues, and over time, would add up to quite a lot. In addition, it becomes concentrated in products processed with the water. The 10-20% directly from the water can easily become three or four times as much.

The EPA lists as health problems caused by lead the following conditions: Interference with formation of red blood cells, anemia, kidney damage, impaired reproductive function, interference with Vitamin D metabolism, impaired cognitive performance, delayed neurological and physical development, elevations in blood pressure.(17) The agency also suggests lead may be a carcinogen, possibly causing kidney tumors and lymphocytic leukemia.(18) Furthermore, it's a known scientific fact that lead poisons the bone marrow.(19) Surely, then, it would be prudent to avoid even "a little bit of lead," assuming that's all fluoridation contributes.

But the evidence shows it's much more than that. Let us tell you a tale of two cities--Tacoma, Washington, and Thurmont, Maryland. Both of them saw significant decline in lead levels only six

months after fluoridation was stopped. (In Tacoma, that was due to equipment problems, in Thurmont, it was a temporary ban by the city council.) Tacoma registered a drop of nearly 50% (20); in Thurmont it was 78%.(21) To the best of our knowledge, no other explanations were offered. In Thurmont the ban is now permanent.(22) In Tacoma, we're told, a battle continues over whether or not to resume fluoridating.

We have more points to add. As we've already mentioned, the EPA says that lead may be implicated in causing leukemia. A booklet published by the Leukemia Society in 1987 noted that chemicals which damage the bone marrow can cause leukemia. The Book of Popular Science, 1974, pointed out that bone marrow is poisoned by lead. (23) Are we to believe, then, nothing is wrong with putting a little bit of lead into the water (from which it will also enter, more concentrated, food and beverages prepared with the water?)

The EPA permits lead-contaminated fluorides to be added; they do not **require** it. Thus, any community, anywhere, could halt the program any time, with the consent of its citizens, who surely would consent if given the facts.

Lead-tainted fluorides are waste products mainly of the aluminum and phosphate fertilizer industries, largely from US companies. But we've learned that in some communities sodium fluoride imported from Japan or sodium silicofluoride from Belgium are used. Neither of these nations fluoridates its own water supplies. (24) (Don't you get the feeling we're in the same category as a Third World country becoming a toxic waste dump for others?)

In California recently the Attorney General and two environmental groups have sued the makers of brass pumps containing lead which could contaminate water from wells. (24) But who is suing companies who sell lead-tainted products to cities for their fluoridation purposes? Who is suing the EPA for allowing it? Where are the lawsuits against the US Public Health Service and the Centers for Disease Control for adamantly promoting it?

In conclusion, there's still the matter of lead being leached from old pipes. Anyone who argues that fuoridation had nothing to do with it will have to explain those well-preserved lead pipes from more than 2000 years ago in **unfluoridated** Roman water.

#### REFERENCES:

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- (5) *Encyclopedia Britannica*, 1957, Vol.21, 545.
- (6) *Ibid.*, 545.
- (7) *Ibid.*, 546.
- (8) *Ibid.*, 545A
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- (10) *Encyclopedia Americana*, 1945, Vol. 1, 456.
- (11) *Encyclopedia Britannica*, 1957, Vol.1, 715.
- (12) *Book of Popular Science*, Vol. 3, 39.
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- (14) *Newsweek*, "Lead and Your Kids," July 15, 1991.
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- (16) *Ibid.*

- (17) *Federal Register*, Vol. 56, No. 110, June 7, 1991, 264.
- (18) *Ibid.*, 265-70.
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- (20) Letter from the Tacoma Public Utilities, Dec. 2, 1992.
- (21) *Fluoride Report*, newsletter, April, 1994, 5.
- (22) *Ibid.*
- (23) *Book of Popular Science*, Vol. 3, 74.
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