

# IS FLUORIDE REALLY ALL THAT SAFE?

**The Fluoride Deception**, by Christopher Bryson, Seven Stories Press, 2004, 374 pages, \$24.95 (ISBN 1-58322-526-9)

REVIEWED BY SHELDON KRIMSKY

**T**HE FLUORIDE DECEPTION" reads like a whodunit. There are conspiracies, cover-ups, human casualties, and broken careers.

The prime suspects in this toxic thriller are compounds of fluoride; the coconspirators represent industry, the military, and the public health community. At the book's ending, the suspect chemicals are not proven guilty beyond a reasonable doubt, but we are left with compelling evidence that powerful interests with high financial stakes have colluded to prematurely close honest discussion and investigation into fluoride toxicity.

Christopher Bryson has woven together an impressive body of evidence that brings into question the near universally held view in the medical and public health communities that fluoridation of public water supplies at current levels (about 1 ppm) is unambiguously safe and does not involve any serious health or environmental trade-offs. Bryson conducted extensive interviews, read many scientific papers, and burrowed through archival sources (there are more than 100 pages of reference notes) to make his argument that fluoride toxicity, even at the levels found in public water supplies, is not a closed case. Some private interests, he alleges, will seek to destroy careers to ensure that scientific studies that raise doubts about the safety of fluoride never get funded—or if they do, never get published.

Few people of prominence will stand up and contest the issue of the safety of fluoride compounds, Bryson claims. One exception is Arvid Carlsson, a Swedish pharmacologist who shared the 2000 Nobel Prize in Physiology or Medicine. In a postscript to the book, Carlsson writes: "Fluoride is a pharmacologically very active compound with an action on a variety of enzymes and tissues in the body already in low concentrations. In concentrations

not far above those recommended it has overt toxic actions." Carlsson was one of the scientists who helped persuade the Swedish Parliament to ban fluoridation of drinking water in that country.

The book summarizes 50 years of fluoride uses in steel, aluminum, phosphate, gasoline, uranium enrichment, refrigerants, and plastics. Bryson shows how fluoride became the "lifeblood of the modern industrial economy." Notwithstanding fluoride's broad industrial applications, its airborne emissions, and its toxic by-products, the public's awareness of fluoride comes primarily from its uses in drinking water, toothpaste, and preadolescent fluoride treatments as a prophylaxis against dental cavities.

There are many resemblances between the history of fluoride regulation and that of other toxic substances. The exigencies of World War II blinded public health regulators to medical reports of occupational hazards from fluoride exposure in those industries where compounds of fluoride were used or produced. The U.S. government did not take kindly to lawsuits filed by farmers for gaseous fluoride damage to their families, their cattle, and their crops, an unintended by-product of nuclear weapons facilities during the Manhattan Project. Postwar economic growth served as a convenient

excuse to ignore evidence that communities were exposed to unhealthy levels of airborne fluoride emissions.

But what is distinguishable about fluoride politics is the connection between this ion and the prevention of dental cavities. Bryson shows us how fluoride's dental applications were skillfully used by corporate stakeholders in their campaign to derail more stringent air and occupational standards for industrial fluoride emissions. Similarly, defense lawyers exploited the positive side of fluoride to protect companies from worker-injury suits.

**AS THE SAYING GOES** in the public health community, adopting an antifluoridation position is a career breaker. This is illustrated in the book by the case of Phyllis Mullenix, a neurotoxicologist hired by the Forsyth Dental Center in Boston to investigate materials used in dentistry. Mullenix found evidence of fluoride neurotoxicity in experimental rats. Mullenix showed that with chronic exposure, the fluoride ion could cross the blood-brain barrier. Moreover, when fluoridated water was fed to pregnant rats, she found the offspring exhibited behavior resembling hyperactivity.

Mullenix recalls the response of a Forsyth administrator to her findings: "You are going against what the dentists and everybody have been publishing for 50 years, that this [fluoride] is safe and effective. You must be wrong. ... You are jeopardizing the entire support of this entire institution. If you publish these studies, NIDR [the National Institute of Dental Research] is not going to fund any more research at Forsyth." Her studies were

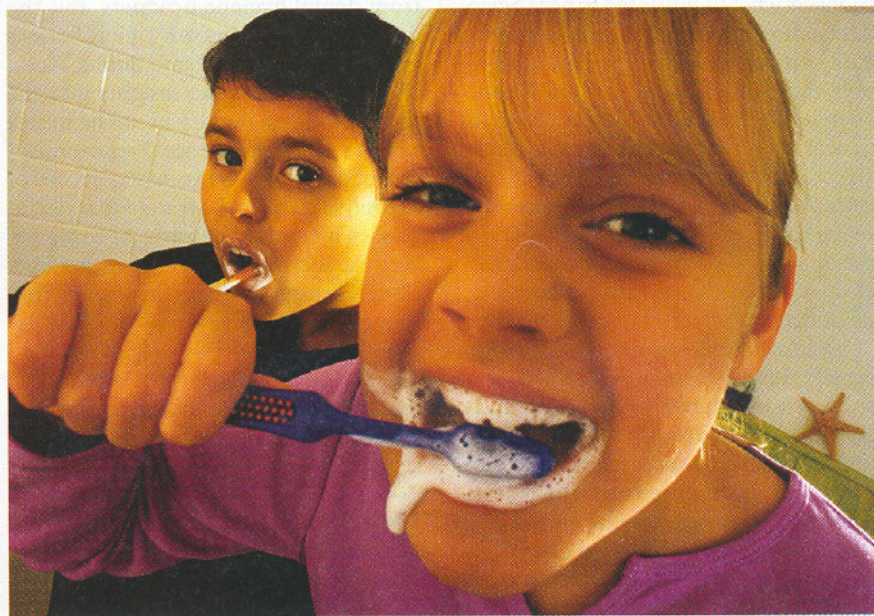
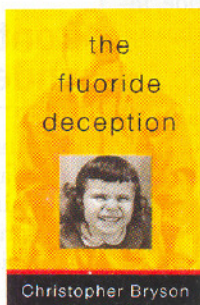


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published in *Neurotoxicology & Teratology*. But within days after the paper's acceptance, her contract with Forsyth was not renewed.

Bryson's investigations into fluoride science led him to a 1962 unpublished study conducted at Kettering Laboratory at the University of Cincinnati, which he found in the basement archive of the laboratory. An industry group contributed nearly half-a-million dollars for a series of toxicological studies that they believed would help them against worker claims of crippling skeletal fluorosis—thickening and fusing of spinal vertebrae.

In one of the key experiments, 42 beagle dogs were exposed to calcium fluoride dust for six hours a day, five days a week—simulating human occupational exposure. According to the results of the study, calcium fluoride damaged the lungs and lymph nodes of the dogs. If released, the study could have provided the critical evidence needed to raise the industrial standard on fluoride emission limitations.

"The Kettering data pointed an arrow directly at the heart of key modern industrial enterprises, where the extraordinary incidence of emphysema in workers potentially 'dwarfed' even the silicosis crisis of the 1930s," Bryson writes. He quotes one toxicologist who was given the long-suppressed study data, who said, "The fact that the Kettering data were not published or made available is a crime against American workers—with profound health consequences for the rest of the nation."

The positive spin of this unpublished report was that the university researchers did not manipulate the science to give the sponsors what they wanted to hear. Scientists refused to fudge the data or give the study a proindustry interpretation. However, there is also a negative spin. The academic investigator at the University of Cincinnati either chose not to or lacked the contractual rights to publish the results. According to Mullenix, "The Kettering Laboratory's long-ago suppression of the dog study helped to perpetuate a cover-up of fluoride's potential for harm as an air pollutant."

Even today there are no legal constraints against the suppression of scientific data from privately funded studies. Recently, New York State Attorney General Eliot Spitzer filed suit against a major pharmaceutical company, charging that it had suppressed clinical trial data that was valuable to the medical community on a drug used to treat adolescent depression. A small group of prominent journals have adopt-

ed a policy that they will not publish studies unless the authors affirm their control over the data and publication. Some members of the medical community are calling for a public database on clinical trials, so that data unfavorable to a sponsor will not be suppressed.

In 1993, the National Academy of Sciences (NAS) issued a report on the health effects of ingested fluoride. The study supported the Environmental Protection Agency's fluoride drinking water standard of 4 mg per L as an "interim standard." It recommended additional research on bone strength, bone fractures, and carcinogenicity. NAS began a second study on fluoride toxicity in November 2002 to review the new scientific literature, as the academy considers the aggregate exposure one can get from all sources of fluoride, including drinking water, food, toothpaste, and dental rinses.

Although most of the book focuses on inorganic fluoride salts, it concludes with an epilogue citing the potential dangers presented by another branch of fluorine compounds—perfluorocarbons. Used in products like Scotchguard and Teflon, these molecules come with their own set of reactivities and toxicities. EPA is taking formal action against DuPont for failing to report birth defects among babies born to female workers who were exposed to perfluorooctanoic acid, a chemical used in its manufacture of Teflon. So there is still plenty of life left in fluoride science and politics.

"The Fluoride Deception" will leave any open-minded readers feeling uneasy about the acceptable levels of fluoride in drinking water, as well as the cumulative sources from dental hygiene products. But the deeper lessons of this story, going back to classified military research during World War II, are the book's insights into the threats to open inquiry in public health and environmental science. Premature closure of debate in science undercuts one of its unique features—a feature that distinguishes it from other forms of fixing belief—namely, science's self-correcting function. Without a scientific culture that supports reexamination of "no risk" results, however strongly held, we may find our public health and environmental policies resting on weak or faulty foundations, which can prolong our blindness to preventable illnesses.

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