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| Our Dec 2010 cover | **From the Townsend Letter**[**December 2010**](http://www.townsendletter.com/Dec2010/Dec2010.html)**Fluoridation: Medicating our Water Part 2***by Gary Null, PhD* |

Part 1 and Part 3 are also online

**Myths Are Very Hard to Dislodge**

We can get a good idea of how much fluoride is safe by working with Roholm's figures. You will remember that after the figures had been corrected, the amount needed to cause crippling fluorosis in a 100- to 229-pound person was reckoned to be 10 to 20 mg per day for 10 to 20 years. Since fluorides accumulate in a linear fashion, the crippling dosage of 10 mg per day for 10 years is the same as 5 mg per day for 20 years, and so on. If we extrapolate this to a normal lifetime with fluoridated water, this is the same as 2.5 to 5 mg per day for 40 to 80 years. But we should note that, for persons with kidney disease, the risk is greater because less fluoride will be eliminated by their malfunctioning kidneys.

It is also important to note that these figures are for crippling fluorosis, the last stage. It will take only 4 years at 10 mg/day, or 16 years at 2.5 mg per day, before a 100-pound individual can expect to experience phase 2, musculoskeletal fluorosis, with chronic joint pain and arthritic symptoms – with or without osteoporosis. That is the amount of fluoride found in just 2-1/2 liters of water. And that's without counting the extra that today is inevitably found in foods, toothpaste, and other sources.

From this it is clear that the only safe limit for fluoride is none.

Even supposing that low concentrations are safe, there is no way to control how much fluoride different people consume, as some take in a lot more than others. For example, laborers, athletes, diabetics, and those living in hot or dry regions can all be expected to drink more water, and therefore more fluoride (in fluoridated areas) than others.61 Due to such wide variations in water consumption, it is impossible to scientifically control what dosage of fluoride a person receives via the water supply.62

In "50 Reasons to Oppose Fluoridation,"63 Paul Connett, PhD, professor of chemistry at St. Lawrence University (New York), states that the supposedly safe fluoride levels in our water may pose a particular danger for any of the millions of people who suffer from thyroid disorders. He explains: "Earlier in the 20th century, fluoride was prescribed by a number of European doctors to reduce the activity of the thyroid gland for those suffering from hyperthyroidism (over active thyroid)."64

With water fluoridation, we are forcing people to drink a thyroid-depressing medication that could promote higher levels of hypothyroidism (underactive thyroid) in the population, and all the subsequent problems related to this disorder. Such problems include depression, fatigue, weight gain, muscle and joint pains, increased cholesterol levels, and heart disease.

It bears noting that, according to the DHHS (1991), fluoride exposure in fluoridated communities is estimated to range from 1.58 to 6.6 mg/day, a range that actually overlaps the dose (2.3–4.5 mg/day) shown to decrease the functioning of the human thyroid.65 This is a remarkable fact, and certainly deserves greater attention considering the rampant and increasing problem of hypothyroidism in the US. (In 1999 the second most prescribed drug of the year was Synthroid, a hormone replacement drug, which is used to treat an underactive thyroid.) More than 20 million people in the US receive treatment for thyroid problems, and many others are thought to go undiagnosed.66

Today, 90% of the fluoride added to our drinking water is no longer a natural sodium fluoride compound. Today's fluoride is industrial waste that is complexed with silica or sodium. "Fluoride complexed with silica or sodium is readily ionized to free fluoride ions that are quickly absorbed in the gastrointestinal tract, whereas, when chemically bound to calcium, less of it ionizes and less is absorbed. Calcium inhibits fluoride absorption and is, in fact, the treatment of choice for fluoride ingestion overdoses."67

Another concern is that fluoride is not found only in drinking water; it is everywhere. Fluoride is found in processed foods, which in the US include nearly all bottled drinks and canned foods.68 Researchers writing in the Journal of Clinical Pediatric Dentistry have found that fruit juices in particular contain significant amounts of fluoride. In a recent study, a variety of popular juices and juice blends was analyzed, and 42% had more than l ppm of fluoride, with some brands of grape juice containing much higher levels – up to 6.8 ppm! The authors cite the common practice of using fluoride-containing insecticide in growing grapes as a factor in these high levels, and they suggest that the fluoride content of beverages be printed on their labels, as is other nutritional information.69 Considering how much juice some children ingest, and the fact that youngsters often insist on particular brands that they consume day after day, labeling seems like a prudent idea.

Clean water activist Jeff Green points out that fluoride is "in Wheaties at 10 ppm, 10 times the amount that you find in water. It's in Post Grape Nuts and Shredded Wheat and Fruit Loops. These are items that people are eating all the time without realizing that it has fluoride in it. Because it's a pesticide residue that's allowed to be on produce now it's taken a big jump and the EPA has allowed it to be at really high levels, 180 ppm on a head of lettuce, 55 ppm on raisins. I mean no child is going to wash all that off."70

Prepared baby foods are a problem, too. A 1997 article in the Journal of the American Dental Association warns that some baby foods contain such high levels of fluoride that babies who eat the food risk dental fluorosis.71 "Any infants who regularly eat more than a couple of ounces of infant foods containing high-fluoride-content chicken would be at elevated fluorosis risk," the authors conclude.72 Babies who eat large quantities of dry infant cereals reconstituted with fluoridated water could ingest substantial quantities of fluoride from this source, this study shows. "Children should also be monitored to make sure that they do not ingest too much fluoride from other sources such as fluoride dentifrice, dietary fluoride supplements or fluoridated water."73

Fluoride exposure during infancy can be expected to increase risk of fluoride-related illness, since a recent study shows that the first year of life is the most critical period for fluoride exposure. Children exposed during the first year of life, and to a lesser extent in the second year, are far more likely to develop fluorosis than those whose exposure begins later. The early mineralizing teeth – the central incisors and first molars – are most likely to be affected.74

This is confirmed by a recent study of fluorosis risk. "There is substantial evidence that fluoridated water, fluoride supplements, infant formulas, and fluoride toothpastes are risk factors for fluorosis," alone and together, reports Ohio State University researcher Dr. Ana Karina Mascarenhas.75

A recent study of fluoridated and nonfluoridated communities in Brazil proved that fluoride toothpaste contributes to fluorosis. In the study, children who started using fluoride before the age of 3 were 4.43 times more likely to have dental fluorosis than those who started using it after the age of 3.76

Connett observes that "the level of fluoride put into water (1 ppm) is 100 times higher than normally found in mothers' milk (0.01 ppm). There are no benefits, only risks, for infants ingesting this heightened level of fluoride at such an early age (this is an age where susceptibility to environmental toxins is particularly high)."77

Fluorosis gets worse as a child approaches puberty, according to study done in Norway. The study showed a significant increase in the severity of fluorosis with increasing age in a high-fluoride community, whereas no change in severity with age was observed in a low-fluoride community. Fluorosis resulting from high fluoride content of drinking water increases between the ages of 10 and 14.78

But beyond this is the larger issue that this study brings up: is it wise to subject children and others who are heavy juice drinkers to additional fluoride in their water?

Here's a little-publicized reality: cooking can greatly increase a food's fluoride content. Peas, for example, contain 12 micrograms of fluoride when raw and 1500 micrograms after they are cooked in fluoridated water, a tremendous difference. Furthermore, fluoride is an ingredient in pharmaceuticals, aerosols, insecticides, and pesticides.

And of course, toothpastes. It's interesting to note that in the 1950s, fluoridated toothpastes were required to carry warnings on their labels saying that they were not to be used in areas where water was already fluoridated. Crest toothpaste went so far as to write: "Caution: Children under 6 should not use Crest." These regulations were dropped in 1958, although no new research was available to prove that the overdose hazard no longer existed. Today, common fluoride levels in toothpaste are 1000 ppm. Research chemist Woodfun Ligon notes that swallowing a small amount adds substantially to fluoride intake. Dentists say that children commonly ingest up to 0.5 mg of fluoride a day from toothpaste.79

Limeback cites studies conducted by the toothpaste manufacturers showing that children under 6 typically swallow as much as 60% of the toothpaste that goes into their mouths. "The warning labels, in my personal opinion, are there to get them off the hook in the next ten years. People who have been exposed to too much fluoride ingestion before the tubes were labeled have a case against the toothpaste companies. They weren't told that a lifetime of fluoride ingestion may be harmful."80

Which raises the question: how safe is all this fluoride? According to scientists and informed doctors, such as Dr. John Lee, it is not safe at all. Lee first took an antifluoridation stance back in 1972, when as chairman of an environmental health committee for a local medical society, he was asked to state its position on the subject. He stated that after investigating the references given by both pro- and antifluoridationists, the group discovered three important things:

One, the claims of benefit of fluoride, the 60% reduction of cavities, was not established by any of these studies. Two, we found that the investigations into the toxic side effects of fluoride have not been done in any way that was acceptable. And three, we discovered that the estimate of the amount of fluoride in the food chain, in the total daily fluoride intake, had been measured in 1943, and not since then. By adding the amount of fluoride that we now have in the food chain, which comes from food processing with fluoridated water, plus all the fluoridated toothpaste that was not present in 1943, we found that the daily intake of fluoride was far in excess of what was considered optimal.81

What happens when fluoride intake exceeds the optimal? The inescapable fact is that this substance has been associated with severe health problems, ranging from skeletal and dental fluorosis to bone fractures, fluoride poisoning, and even cancer.

Dental Fluorosis

The NAS publication "Health Effects of Ingested Fluoride" reports that in areas with optimally fluoridated water (1 ppm, either natural or added), dental fluorosis levels in recent years ranged from 8% to 51%. Recently, a prevalence of slightly over 80% was reported in children 12 to 14 years old in Augusta, Georgia.82 Other research gives higher figures. In a report titled "Trends in Prevalence of Dental Fluorosis in North America," studies found that 35% to 60% of people living in fluoridated communities experience dental fluorosis, while nonfluoridated areas figure from 20% to 45%.83

Fluoride is a noteworthy chemi­cal additive in that its officially acknowledged benefit and damage levels are about the same. Writing in the Progressive, science journalist Daniel Grossman elucidates this point: "Though many beneficial chemicals are dangerous when consumed at excessive levels, fluoride is unique because the amount that dentists recommend to prevent cavities is about the same as the amount that causes dental fluorosis."84 Although the ADA and the US government consider dental fluorosis only a cosmetic problem, the American Journal of Public Health says: "Brittleness of moderately and severely mottled teeth may be associated with elevated caries levels."85 In other words, in these cases the fluoride is causing the exact problem that it's supposed to prevent. Yiamouyiannis adds, "In highly naturally-fluoridated areas, the teeth actually crumble as a result. These are the first visible symptoms of fluoride poisoning."86

Also, when considering dental fluorosis, there are factors beyond the physical that you can't ignore – the negative psychological effects of having moderately to severely mottled teeth. These were recognized in a 1984 National Institute of Mental Health panel that looked into this problem.87

A telling trend is that TV commercials for toothpaste, and toothpaste tubes themselves, are now downplaying fluoride content as a virtue. This was noted in an article in the Sarasota/Florida ECO Report,88 whose author, George Glasser, thinks that manufacturers are distancing themselves from the additive because of fears of lawsuits. The climate is ripe for these, and Glasser points out that such a class action suit has already been filed in England against the manufacturers of fluoride-containing products on behalf of children suffering from dental fluorosis – a major threat, when one considers that the US Centers for Disease Control (CDC) is reporting that from one-third to one-half of all schoolchildren in the US suffer from fluoride overdose and sport the pitted, discoloration of dental fluorosis.89

Still, certain segments of industry have yet to get the message. A recent newspaper ad campaign promotes Dannon's Fluoride to Go spring water "for kids who can't sit still."90 Supplied in convenient child-sized bottles with the pop-up "athletic" cap that children adore, the product perpetuates fluoride's false promise of better dental health for the new generation of children for whom bottled water is more desirable than soda pop. The irony is that the shift from soda to water is one thing that does affect children's dental health significantly. Fluoride is totally out of place in this scenario. It makes one wonder how much fluoride might be in other brands of bottled water, including Evian and Volvic, which are owned by Dannon's parent company, Danone.

Skeletal Fluorosis

When fluoride is ingested, approximately 93% of it is absorbed into the bloodstream. A good part of the material is excreted, but the rest is deposited in the bones and teeth, and can cause crippling skeletal fluorosis.91 This condition can damage the musculoskeletal and nervous systems and result in muscle wasting, limited joint motion, spine deformities, and calcification of the ligaments, as well as neurological deficits.92

Large numbers of people in Japan, China, India, the Middle East, and Africa have been diagnosed with skeletal fluorosis from drinking naturally fluoridated water. In India alone, nearly a million people suffer from the affliction.93 While only a dozen cases of skeletal fluorosis have been reported in the US, Chemical and Engineering News states: "Critics of the EPA standard speculate that there probably have been many more cases of fluorosis – even crippling fluorosis – than the few reported in the literature because most doctors in the US have not studied the disease and do not know how to diagnose it."94 Because some symptoms of skeletal fluorosis mimic those of arthritis, the first two clinical phases of fluorosis can be easily misdiagnosed.95 According to Connett, the causes of most forms of osteoarthritis are unknown. It is not implausible that the high prevalence of arthritis in America (42 million Americans have it) may be related to our high levels of fluoride intake.96

Limeback says:

We're quite concerned that fluoride accumulates through a lifetime of water fluoridation and causes the bone to become more brittle. We've started a study, and we're close to publishing it, that shows that people who have been exposed to just 20 to 30 years of water fluoridation have twice the amount of fluoride in their bones. Now there are all kinds of epidemiological studies to show that people who live in fluoridated areas have a higher risk for hip and other kinds of fractures, such as forearm fractures when they fall down. So this is quite a concern. I personally don't think that we need to be ingesting fluoride to protect our kids' teeth because they're already protected at a maximum. The rest of us are swallowing all this fluoride from the drinking water and possibly increasing the risk for bone fracture. It just doesn't make sense at all.97

Radiological changes in bone occur when fluoride exposure is 5 mg/day, according to the late Dr. George Waldbott, author of Fluoridation: The Great Dilemma. While this 5 mg/day level is the amount of fluoride ingested by most people living in fluoridated areas, the number increases for diabetics and laborers, who can ingest up to 20 mg of fluoride daily.98 In addition, a survey conducted by the Department of Agriculture shows that 3% of the US population drinks 4 liters or more of water every day. If these individuals live in areas where the water contains a fluoride level of 4 ppm, allowed by the EPA, they are ingesting 16 mg/day from the consumption of water alone, and are thus at greater risk for getting skeletal fluorosis.99

Bone Fractures

At one time, fluoride therapy was recommended for building denser bones and preventing fractures associated with osteoporosis. Because fluoride has been strongly associated with bone fragility and breakage, several articles in peer-reviewed journals now suggest that fluoride actually causes more harm than good. Three studies reported in the Journal of the American Medical Association showed links between hip fractures and fluoride.100-102 Findings here were, for instance, that there is "a small but significant increase in the risk of hip fractures in both men and women exposed to artificial fluoridation at 1 ppm."103 In addition, the New England Journal of Medicine reports that people given fluoride to cure their osteoporosis actually wound up with an increased nonvertebral fracture rate.104 Austrian researchers have also found that fluoride tablets make bones more susceptible to fractures.105 The US National Research Council states that the US hip fracture rate is now the highest in the world.106

A 2000 article in the journal Fluoride describes the bone effects of fluoride in detail.107 Fluoride may increase bone quantity (osteofluorosis, osteosclerosis) but also decrease bone quality and bone strength. It is well known that pharmacological doses of fluoride increase the risk of torsion-type fractures (such as hip fractures) despite the appearance of greater bone density. Conventional medicine interprets the observed fluoride-induced increase of serum alkaline phosphatase concentration as a sign of osteoblast activity. Actually, it is a reflection of increased mortality of osteocytes within bone. Osteocytes are rich in alkaline phosphatase, which is released when the cells are killed by fluoride. It is unlikely, therefore, that a window of fluoride-induced bone benefit exists.108

Louis V. Avioli, professor at the Washington University School of Medicine, says in a 1987 review of the subject: "Sodium fluoride therapy is accompanied by so many medical complications and side effects that it is hardly worth exploring in depth as a therapeutic mode for postmenopausal osteoporosis, since it fails to decrease the propensity for hip fractures and increases the incidence of stress fractures in the extremities."109

Fluoride's deleterious effect on bone is well documented. Early experiments using large doses of fluoride as a treatment for osteoporosis had disastrous results. Dr. C. Rich warned that rather than strengthening bones, fluoride could cause osteoarthritis, as well as gastric pain, calcification of the arteries, and visual disturbances.110

Connett cites two epidemiological studies suggesting a possible association with osteosarcoma, bone cancer, in young men living in fluoridated areas.111 One is the report of the US National Toxicology Program mentioned earlier, which first uncovered the epidemiological evidence of increased osteosarcoma in boys and young men living in fluoridated areas.112 The second is a study conducted by the New Jersey Department of Health. Dr. Perry Cohn studied the incidence of the rare bone cancer in seven New Jersey counties relative to water fluoridation. In fluoridated areas, incidence of osteosarcoma in boys under age 10 was 4.6 times higher than in unfluoridated areas, 3.5 times higher in the 10-to-19 age group, and over twice as high in the 20-to-49 age group.113

Scientists at Yale University discovered that doses as low as 1 ppm of fluoride decrease bone strength and elasticity, making fracture more likely.114 Another group of researchers found that fluoride accelerated the development of osteoporosis.115 A 1992 study of elderly patients found "a small but significant increase in the risk of hip fracture in both men and women exposed to artificial fluoridation at 1 part per million." As with the bone cancer, the adverse effects of fluoride accumulation on bone strength were greater with men.116

Fluoride has the potential to increase skeletal mass to a greater extent than any other pharmacologic agent, yet it has proven difficult to translate this into therapeutic benefit for patients with low bone mass in diseases such as osteoporosis, according to a 1996 study by Michigan's Center for Osteoporosis Research. This apparent paradox can be explained in part by toxic actions of the ion on skeletal mineralization, impairment of the normal processes of bone resorption, and fluoride-induced decreases in strength per unit of bone (mass or volume).117

Belgian arthritis researchers reviewed 30 years of clinical research on fluoride in the treatment of osteoporosis. They point out that fluoride has a dual effect on osteoblasts (the cells from which bones are made). On the one hand, it increases the birthrate of osteoblasts, while on the other, it has a toxic effect on the individual cell with mineralization impairment and reduced apposition rate resembling osteomalacia. Fluoride has a positive effect on axial bone density, they say, but the axial bone gain is not matched by similar changes in cortical bone. (The cortical bone is the hard outer part of bone where its main strength lies.)118

Among the studies cited, two show an increased rate of hip fracture among patients treated with high doses of fluoride (50–75 mg per day).119,120

In an experiment conducted with bovine bones, fluoride treatment reduced the mechanical strength of bone tissue by converting small amounts of bone mineral to mostly calcium fluoride. This action reduces the structurally effective bone mineral content and also possibly affects the interface bonding between the bone mineral and the organic matrix of the bone tissue.121 A Polish study published in 1999 found that treat­ment with fluoridated water decreases the bending strength of the femoral neck and shaft in laboratory rats.

A New Zealand review of recent scientific literature reveals a consistent pattern of evidence – hip fractures, skeletal fluorosis, the effect of fluoride on bone structure, fluoride levels in bones, and osteosarcomas – pointing to the existence of causal mechanisms by which fluoride damages bones. Public health authorities in Australia and New Zealand have appeared reluctant to consider openly and frankly the implications of this and earlier scientific evidence unfavorable to the continuation of the fluoridation of drinking water supplies.122

Connett reports that, of 18 studies conducted since 1990, 10 have found an association between water fluoridation and hip fractures in the elderly.123 "One study found a dose-related increase in hip fracture as the concentration of fluoride rose from 1 ppm to 8 ppm (Li et al. 1999; to be published). Hip fracture is a very serious issue for the elderly, as a quarter of those who have a hip fracture die within a year of the operation, while 50 percent never regain an independent existence."124

**Fluoride Poisoning**

In May 1992, 260 people were poisoned, and one man died, in Hooper Bay, Alaska, after drinking water contaminated with 150 ppm of fluoride. The accident was attributed to poor equipment and an unqualified operator.125 Was this a fluke? Not at all. Over the years, the CDC has recorded several incidents of excessive fluoride permeating the water supply and sickening or killing people. We don't usually hear about these occurrences in news reports, but interested citizens have learned the truth from data obtained under the Freedom of Information Act. Here is a partial list of toxic spills that we have not been told about:

July 1993, Chicago, Illinois: Three dialysis patients died and five experienced toxic reactions to the fluoridated water used in the treatment process. The CDC was asked to investigate, but to date there have been no press releases.

May 1993, Kodiak, Alaska (Old Harbor): The population was warned not to consume water due to high fluoride levels. They were also cautioned against boiling the water, since this concentrates the substance and worsens the danger. Although equipment appeared to be functioning normally, 22–24 ppm of fluoride was found in a sample.

July 1992, Marin County, California: A pump malfunction allowed too much fluoride into the Bon Tempe treatment plant. Two million gallons of fluoridated water were diverted to Phoenix Lake, elevating the lake surface by more than two inches and forcing some water over the spillway.

December 1991, Benton Harbor, Michigan: A faulty pump allowed approximately 900 gallons of hydrofluosilicic acid to leak into a chemical storage building at the water plant. City engineer Roland Klockow stated: "The concentrated hydrofluosilicic acid was so corrosive that it ate through more than two inches of concrete in the storage building." This water did not reach consumers, but fluoridation was stopped until June 1993. The original equipment was only two years old.

July 1991, Porgate, Michigan: After a fluoride injector pump failed, fluoride levels reached 92 ppm and resulted in approximately 40 children developing abdominal pains, sickness, vomiting, and diarrhea at a school arts and crafts show.

November 1979, Annapolis, Maryland: One patient died and eight became ill after renal dialysis treatment. Symptoms included cardiac arrest (resuscitated), hypotension, chest pain, difficulty breathing, and a whole gamut of intestinal problems. Patients not on dialysis also reported nausea, headaches, cramps, diarrhea, and dizziness. The fluoride level was later found to be 35 ppm; the problem was traced to a valve at a water plant that had been left open all night.126

Instead of addressing fluoridation's problematic safety record, officials have chosen to cover it up. For example, the ADA says in one booklet distributed to health agencies that "Fluoride feeders are designed to stop operating when a malfunction occurs ... so prolonged over-fluoridation becomes a mechanical impossibility."127

In addition, the information that does reach the population after an accident is woefully inaccurate. A spill in Annapolis, Maryland, placed thousands at risk, but official reports reduced the number to eight.128

Perhaps officials are afraid that they will invite more lawsuits like the one for $480 million by the wife of a dialysis patient whose brain was injured as the result of fluoride poisoning.

Not all fluoride poisoning is accidental. For decades, industry has knowingly released massive quantities of fluoride into the air and water. Disenfranchised communities, with people least able to fight back, are often the victims. Medical writer Joel Griffiths relays this description of what industrial pollution can do, in this case to a devastatingly poisoned Indian reservation:

Cows crawled around the pasture on their bellies, inching along like giant snails. So crippled by bone disease they could not stand up, this was the only way they could graze. Some died kneeling, after giving birth to stunted calves. Others kept on crawling until, no longer able to chew because their teeth had crumbled down to the nerves, they began to starve. …They were the cattle of the Mohawk Indians on the New York-Canadian St. Regis Reservation during the period 1960–1975, when industrial pollution devastated the herd – and along with it, the Mohawks' way of life. ... Mohawk children, too, have shown signs of damage to bones and teeth.129

Mohawks filed suit against the Reynolds Metals Company and Alcoa in 1960, but ended up settling out of court, where they received $650,000 for their cows.130

**Cancer**

Numerous studies demonstrate links between fluoridation and cancer; however, agencies promoting fluoride consistently refute or cover up these findings.

Even in the earliest days of fluoridation, there were clear indications of the fluoride-cancer link. In the early 1950s, Dr. Alfred Taylor, a biochemist at the University of Texas, conducted a series of experiments in which cancer-prone mice consuming water treated with sodium fluoride were found to have shorter lifespans than similar mice drinking distilled water.131 Taylor's studies were carried out twice, because after the first run the scientist himself discovered that the chow that his mice had eaten had itself contained fluoride, thus clouding the results. On his own initiative, Taylor ran the whole experiment a second time. The second run, with mice fed fluoride-free chow, was conclusive. Clearly fluoride could no longer be considered a harmless additive to drinking water.132

John Remington Graham and Pierre-Jean Morin, in their exhaustive survey of fluoridation litigation,133 observe that "Taylor's work was published at a politically sensitive time, because the last stages of the much-boasted surveys at Newburgh and Kingston were under way. The obvious meaning of Dr. Taylor's results was that a possible danger to human health had been overlooked, and that widespread fluoridation should be delayed until the situation had been clarified. However, the ADA and the USPHS had already endorsed and begun the drive to promote fluoridation."134

What happened next is a classic study in denial. The final report published by the authors of the Newburgh-Kingston study refers only to the results of Taylor's first round of tests, even though his second, conclusive round had been peer-reviewed and published over two years before. They wrote:

The reports by Alfred Taylor, a biochemist at the University of Texas, on the increased incidence of cancer in mice drinking fluoride treated water have been shown to be unfounded, since the food he was giving the mice had many times the fluoride content of drinking water, and the food was supplied to both the control and the experimental groups. Subsequent tests did not confirm the differences.135

And this same denial has been repeated over and over for the succeeding 45 years by the USPHS and its affiliates. Graham and Morin cite a standard history of the National Institute of Dental Research, published over 35 years later, alleging that Taylor refrained from publishing his findings "because he was unable to confirm those results in a second experiment."136 The author of this fabrication goes on to say that "a literature search of scientific journals failed to show any publication of this work by Taylor."137 Graham and Morin comment: "The most powerful forensic evidence of the importance of Dr. Taylor's work is that the USPHS officials have done so much to conceal it."138

That was not to be the last study to reveal carcinogenic effects for fluoride, and it was not to be the last fluoride-related cover-up. In 1977, Yiamouyiannis and Dr. Dean Burk, former chief chemist at the National Cancer Institute (NCI), released a study that linked fluoridation to 10,000 cancer deaths per year in the US. Their inquiry, which compared cancer deaths in the 10 largest fluoridated American cities to those in the 10 largest unfluoridated cities between 1940 and 1950, discovered a 5% greater rate in the fluoridated areas.139 The NCI disputed these findings, since its earlier analysis apparently failed to pick up these extra deaths. Federal authorities claimed that Yiamouyiannis and Burk were in error, and that any increase was caused by statistical changes over the years in age, gender, and racial composition.140

In order to settle the question of whether or not fluoride is a carcinogen, a Congressional sub­committee instructed the National Toxicology Program (NTP) to perform another investigation.141 That study, due in 1980, was not released until 1990. However, in 1986, while the study was delayed, the EPA raised the standard fluoride level in drinking water from 2.4 to 4 ppm.142 After this step, some of the government's own employees in NFFE Local 2050 took what the Oakland Tribune termed the "remarkable step of denouncing that action as political."143

When the NTP study results became known in early 1990, union president Dr. Robert Carton, who works in the EPA's Toxic Substances Division, published a statement. It read, in part:

Four years ago, NFFE Local 2050, which represents all 1100 professionals at EPA headquarters, alerted then Administrator Lee Thomas to the fact that the scientific support documents for the fluoride in drinking water standard were fatally flawed. The fluoride juggernaut proceeded as it apparently had for the last 40 years – without any regard for the facts or concern for public health.

EPA raised the allowed level of fluoride before the results of the rat/mouse study ordered by Congress in 1977 was complete. Today, we find out how irresponsible that decision was. The results reported by NTP, and explained today by Dr. Yiamouyiannis, are, as he notes, not surprising considering the vast amount of data that caused the animal study to be conducted in the first place. The results are not surprising to NFFE Local 2050 either. Four years ago we realized that the claim that there was no evidence that fluoride could cause genetic effects or cancer could not be supported by the shoddy document thrown together by the EPA contractor.

It was apparent to us that EPA bowed to political pressure without having done an in-depth, independent analysis, using in-house experts, of the currently existing data that show fluoride causes genetic effects, promotes the growth of cancerous tissue, and is likely to cause cancer in humans. If EPA had done so, it would have been readily apparent – as it was to Congress in 1977 – that there were serious reasons to believe in a cancer threat.

The behavior by EPA in this affair raises questions about the integrity of science at EPA and the role of professional scientists, lawyers and engineers who provide the interpretation of the available data and the judgments necessary to protect the public health and the environment. Are scientists at EPA there to arrange facts to fit preconceived conclusions? Does the Agency have a responsibility to develop world-class experts in the risks posed by chemicals we are exposed to every day, or is it permissible for EPA to cynically shop around for contractors who will provide them the 'correct' answers?144

What were the NTP study results? Out of 130 male rats that ingested 45 to 79 ppm of fluoride, 5 developed osteosarcoma, a rare bone cancer. There were cases, in both males and females at those doses, of squamous cell carcinoma in the mouth.145 Both rats and mice had dose-related fluorosis of the teeth, and female rats suffered osteosclerosis of the long bones.146

When Yiamouyiannis analyzed the same data, he found mice with a particularly rare form of liver cancer, known as hepatocholangiocarcinoma. This cancer is so rare, according to Yiamouyiannis, that the odds of its appearance in this study by chance are 1 in 2 million in male mice and 1 in 100,000 in female mice.147 He also found precancerous changes in oral squamous cells, an increase in squamous cell tumors and cancers, and thyroid follicular cell tumors as a result of increasing levels of fluoride in drinking water.148

A March 13, 1990, New York Times article commented on the NTP findings: "Previous animal tests suggesting that water fluoridation might pose risks to humans have been widely discounted as technically flawed, but the latest investigation carefully weeded out sources of experimental or statistical error, many scientists say, and cannot be discounted."149

In the same article, biologist Dr. Edward Groth noted: "The importance of this study ... is that it is the first fluoride bioassay giving positive results in which the latest state-of-the-art procedures have been rigorously applied. ... It has to be taken seriously."150

On February 22, 1990, the Medical Tribune, an international medical news weekly received by 125,000 doctors, offered the opinion of a federal scientist who preferred to remain anonymous:

It is difficult to see how EPA can fail to regulate fluoride as a carcinogen in light of what NTP has found. Osteosarcomas are an extremely unusual result in rat carcinogenicity tests. Toxicologists tell me that the only other substance that has produced this is radium....The fact that this is a highly atypical form of cancer implicates fluoride as the cause. Also, the osteosarcomas appeared to be dose-related, and did not occur in controls, making it a clean study.151

Public health officials were quick to assure a concerned public that there was nothing to worry about. The ADA said that the occurrence of cancers in the lab may not be relevant to humans since the level of fluoridation in the experimental animals' water was so high. But the Federal Register, the handbook of government practices, disagrees: "The high exposure of experimental animals to toxic agents is a necessary and valid method of discovering possible carcinogenic hazards in man. To disavow the findings of this test would be to disavow those of all such tests, since they are all conducted according to this standard."152

As a February 5, 1990, Newsweek article pointed out: "Such mega dosing is standard toxicological practice. It's the only way to detect an effect without using an impossibly large number of test animals to stand in for the humans exposed to the substance."153 And, as the Safer Water Foundation explains, higher doses are generally administered to test animals to compensate for the animals' shorter lifespan and because humans are generally more vulnerable than test animals on a body-weight basis.154

Several other studies link fluoride to genetic damage and cancer. An article in Mutation Research says that a study by Proctor and Gamble, the very company that makes Crest toothpaste, did research showing that 1 ppm fluoride causes genetic damage.155 Results were never published; but Proctor and Gamble called them "clean," meaning that animals were supposedly free of malignant tumors. Not so, according to scientists who believe that some of the changes observed in test animals could be interpreted as precancerous.156 Yiamouyiannis says that the Public Health Service sat on the data, which were finally released via a Freedom of Information Act request in 1989. "Since they are biased, they have tried to cover up harmful effects," he says. "But the data speaks for itself. Half the amount of fluoride that is found in the New York City drinking water causes genetic damage."157

A National Institutes of Environmental Health Sciences publication, Environmental and Molecular Mutagenesis, also linked fluoride to genetic toxicity when it stated that "in cultured human and rodent cells, the weight of evidence leads to the conclusion that fluoride exposure results in increased chromo­some aberrations."158 The result of this is not only birth defects but the mutation of normal cells into cancer cells. The Journal of Carcinogenesis further states that "fluoride not only has the ability to transform normal cells into cancer cells but also to enhance the cancer-causing properties of other chemicals."159

Surprisingly, the USPHS put out a report called "Review of fluoride: benefits and risks," in which it showed a substantially higher incidence of bone cancer in young men exposed to fluoridated water compared with those who were not. The New Jersey Department of Health also found that the risk of bone cancer was about three times as high in fluoridated areas as in nonfluoridated areas.160

Despite cover-up attempts, the light of knowledge is filtering through to some enlightened scientists. Regarding animal test results, the director of the US National Institute of Environmental Health Sciences, James Huff, does say: "The reason these animals got a few osteosarcomas was because they were given fluoride. ... Bone is the target organ for fluoride."161 Toxicologist William Marcus adds: "Fluoride is a carcinogen by any standard we use. I believe EPA should act immediately to protect the public, not just on the cancer data, but on the evidence of bone fractures, arthritis, mutagenicity, and other effects."162

One group working to illuminate the fluoride cover-up is the Environmental Working Group (EWG) out of Washington, DC. In a letter referring to a 2005 Harvard University study, EWG Senior Vice President Richard Wiles requested that the National Toxicology Program declare fluoride in tap water a known or probable cancer cause.163 Expressing a similar sentiment to British newspaper the Observer, Wiles stated: "I've spent 20 years in public health trying to protect kids from toxic exposure. Even with DDT, you don't have the consistently strong data that the compound can cause cancer as you now have with fluoride."164 The study that got the EWG talking became available in 2001 and clearly linked fluoride in tap water, at levels common in most of America, to a rare form of bone cancer called osteosarcoma.165

Connett noted: "Some of the earliest opponents of fluoride were biochemists and at least 14 Nobel Prize winners are among numerous scientists who have expressed their reservations about the practice of fluoridation."166 He cites Dr. James Sumner, who won the Nobel Prize for his work on enzyme chemistry, who says: "We ought to go slowly. Everybody knows fluorine and fluoride are very poisonous substances. ...We use them in enzyme chemistry to poison enzymes, those vital agents in the body. That is the reason things are poisoned; because the enzymes are poisoned and that is why animals and plants die."167

It is instructive to note that the fluoride compounds that are added to our drinking water are not pharmaceuticals. They are direct, unfiltered waste products of the aluminum and fertilizer industries.

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