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Chemistry textbook shows fluoridation dangers

It is no secret that a distinctly pro fluoridation viewpoint pervades most science texts currently published in the United States and elsewhere in the English speaking world. Such a stance has apparently long been regarded by authors and book editors as the "scientifically" appropriate and acceptable outlook for them to adopt.



It comes as a welcome surprise to find that a leading textbook publisher has broken away from this one sided approach. The Boston firm of Allyn and Bacon, Inc., recently released a new edition of a well received basic general chemistry text which contains, In contrast to the first edition, a substantial exposition of "some of the negative aspects of fluoridation" in addition to a fair presentation of claims in favor of fluoridation.

Directed "to meet the special needs of the non science student in on Introductory chemistry course," Applied Chemistry, Second Edition, by Professor William R. Stine of Wilkes College, Wilkes Barre, Pa., provides a highly readable account of a broad spectrum of contemporary topics in chemistry ranging from nuclear energy to chemotherapy with emphasis on "timely and interesting applications. "

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**Dr. Albert W. Burgstahler
Professor of Chemistry
University of Kansas**

For the benefit of our readers, we are pleased to reprint the following portion of a section on fluorides and dental care in Chapter 19 of Applied Chemistry (pp. 413 & 416).

Although most health authorities In the United States still maintain that fluoridation of water supplies is both beneficial and safe, world scientific opinion on this issue Is far from unanimous. The following is a summary of some of the negative aspects of fluoridation as presented by Dr. Albert W. Burgstahler, Professor of Chemistry at the University of Kansas.

The powerful toxic properties of fluorine cam into special prominence in 1931 with the discovery that the fluoride ion in drinking water is responsible for the endemic dental defect known as mottled enamel. Previously, the devastating effects of volcanic and industrial fluoride emissions on livestock and vegetation had been recognized, and the acute human toxicity of fluoride in decigram amounts was well known, but the chronic, cumulative toxicity of fluoride to humans at milligram levels of intake still awaited investigation.

Physiologically, fluoride is a potent enzyme inhibitor (comparable to lead and to cyanide ion) that accumulates in bones and teeth and is readily transported to sensitive soft tissues. Mottled enamel or dental fluorosis, which results from disturbance of the enamel forming cells by fluoride during the period of tooth formation, is one of the first signs of general chronic fluoride poisoning.

Surveys by the U.S. Public Health Service during the thirties indicated less tooth decay among children in communities where dental fluorosis was found. Although it was recognized at the time that this caries reduction might be due in part to other components of the drinking water beside fluoride and in fact later work showed this was indeed the case the proposal was made to increase the fluoride content of low fluoride water supplies to a level (about 1 ppm) that supposedly would be effective for caries prevention yet not cause significant dental fluorosis or other toxic effects. Subsequent findings, however, have shown that this goal has not been achieved. Fluoridation has not proved to be safe, and its anti caries effect has been only marginal at best.

Although proponents of fluoridation often claim that fluoride is an essential nutrient, this view has been repeatedly disproved. Fluoride has not been shown to be required for normal growth or reproduction in animals or humans consuming an otherwise adequate diet, nor for any specific biological function or mechanism. Since healthy bones and decay free teeth are found where very little fluoride is present in the drinking water or diet, the claim that fluoride is essential is not convincing. Tooth decay in modern society is not caused by lack fluoride but primarily by diets overburdened with refined foods, especially sugar. Such diets often lack sufficient amounts of major tooth building minerals calcium, magnesium, and phosphorus, as well as critical vitamins and trace elements like zinc, molybdenum, and strontium.

With fluoridation there has also been a significant increase in dietary as well as waterborne fluoride intake. When foods are cooked in fluoridated water the fluoride content increases three to five fold. On the other hand, the recommendation of 0.7 to 1.2 ppm fluoride in the drinking water is based in part on studies conducted in the forties by the U.S. Public Health Service indicating that "the average diet appears to provide 0.2 0.3 mg of fluorine daily" and that, in the case of children 1-12 years old, drinking water containing 1 ppm fluorine will contribute an estimated 0.4 1.1 mg fluorine daily above the fluorine in the food."

Currently, however, because of the widespread use of fluoridated water for commercial food and beverage processing and preparation, the average dietary intake of fluoride has increased to at least 0.5 mg/day, even in non fluoridated communities. In localities with fluoridated water, the fluoride intake from food and beverages, exclusive of the drinking water, is reported to be 1 to 3 mg/day. Thus, with an additional 1 to 2 mg of fluoride from the drinking water, the average adult total daily intake of fluoride in a fluoridated community is now anywhere from 2 to 5 mg/day well within the range recognized as potentially toxic by the USPHS (United States Public Health Service) when fluoridation was initiated in the mid forties. Persons in hot environments and others who drink large amounts of water obviously have even higher intakes.

A 10 percent incidence of visible but supposedly "unobjectionable" dental fluorosis was predicted for artificial fluoridation, but official surveys reveal that it is at least 15 to 30 percent. Fluorosed teeth have an abnormal, chalky appearance, often with unsightly markings, which in adulthood can acquire permanent yellow or even brown stains. Although reputedly more resistant to caries, such teeth often develop cavities, and when they do they are usually more difficult to repair because they are hypoplastic and tend to break or chip more easily and fail to hold fillings tightly.

Dental fluorosis, however, is only one of the many toxic effects of fluoridation. Competent laboratory studies reveal, among other things, significant damage by 1 ppm fluoridated water to mammalian chromosomes, kidney enzymes, mineral metabolism, fat digestion, and blood cells, as well as injury to sensitive plants like gladiolas. Cancer death rates in persons aged 45 and over and the number of Down's syndrome babies born to younger mothers have been found to be higher in fluoridated than in non fluoridated cities. These findings have been disputed but not refuted by proponents.

In children only about half the fluoride that is ingested is eliminated. In adults the proportion of fluoride that is retained is smaller except when kidney function is impaired. Persons with nephritis excrete only about 60 percent as much fluoride as those with healthy kidneys. Children with nephrogenic diabetes insipidus or untreated pituitary diabetes have been found to develop severe dental fluorosis from drinking water containing only 1 or even 0.5 ppm fluoride.

The ability of fluoridated water to contribute to kidney disorders has been questioned, but it has been clearly demonstrated by in vivo studies in laboratory animals as well as clinically in humans. Thus, after nine months on 1 ppm fluoridated drinking water, golden hamsters showed a 48 percent inhibition of the enzyme succinic dehydrogenase in their kidneys compared to animals on fluoride free water. Similarly, squirrel monkeys displayed cytochemical and enzyme abnormalities in their kidneys after 18 months on fluoridated water. Moreover, in the final 10 months of this study, which was performed at the Yerkes Primate Research Center at Emory University, water consumption by the monkeys drinking fluoridated water was significantly higher than in those on fluoride free water just as has been observed in people residing in fluoridated communities.

Numerous investigations, published in reputable medical journals, show that clinically demonstrable nondental toxic effects are caused by 1 ppm fluoride in drinking water. The symptoms are those first recognized by the distinguished pioneer fluoride researcher, Kai Roholm, in his famous studies on the effects of fluoride in Danish aluminum foundry workers. Because the symptoms are so common they are easily mistaken as being due to other causes. They include: headache, excessive thirst, muscular weakness, involuntary muscle spasms, extreme tiredness, gastric distress, colitis, low back and joint pain and stiffness, urinary tract irritation, skin eruptions, mouth sores, and visual disturbances involving the retina.

Persons in poor health and those who have allergy, asthma, kidney disease, diabetes, gastric ulcer, low thyroid function, and deficient nutrition are especially susceptible to the toxic effects of fluoride in drinking water. In addition, fluoride in beverages (especially tea), food, air, drugs, tobacco, toothpaste, and mouth rinses can also precipitate or contribute to such intoxication.

When the illness is caused by fluoride in the drinking water, and is not too far advanced, the symptoms promptly disappear or subside without medication simply by substitution of distilled or other low fluoride water for all drinking and cooking and avoidance of high fluoride foods, such as mechanically de-boned meat, skin of chicken, bony ocean fish, tea, and gelatin prepared with fluoridated water. Likewise, they immediately return when the use of fluoridated water is resumed. In many cases medical diagnosis has been fully confirmed by blind or double blind challenge tests with coded bottles of fluoridated and nonfluoridated water.

Unfortunately, because of vigorous denials by health authorities committed to promoting fluoridation, fluoride illness of this nature is not generally recognized by either the public nor the medical profession. Yet even the Physicians' Desk Reference warns of such toxic reactions to prescription supplements containing the amount of fluoride (0.5 mg) present in only one pint of fluoridated water:

"In hypersensitive individuals, fluorides occasionally cause skin eruptions such as atopic dermatitis, eczema or urticaria. Gastric distress, headache and weakness have also been reported. These hypersensitive reactions usually disappear promptly after discontinuation of the fluoride."

Although proponent surveys claim significantly less tooth decay in children who drink fluoridated water from birth, independent studies show widely varying results, including even increased dental caries in some children. At best, there is a delay of two to three years in the appearance of new cavities, but the rate of decay remains virtually unchanged. Equally important is the fact that overall dental costs have not become lower in fluoridated communities, nor are there fewer dentists now practicing or needed in fluoridated cities than in nonfluoridated ones.

The fact is, in contrast to the highly questionable results of fluoridation, healthy, decay free teeth consistently issue from adequate dental nutrition and proper oral hygiene. Generous intake of the known tooth building minerals during the critical years of tooth formation and

growth, substitution of whole grain flour products for refined ones, rigorous elimination or restriction of refined sugar consumption, and thorough daily cleaning of the teeth, especially before retiring, have been shown repeatedly to provide safe and effective protection against dental decay.

Internationally, fluoridation has come under increasing attack. Because of evidence of harmful effects, such as outlined here, plus lack of sufficient dental benefit, fluoridation has been rejected or abandoned in many European countries, including Austria, Belgium, Denmark, France, Holland, Hungary, Italy, Luxembourg, Norway, Sweden, West Germany, and Yugoslavia. Even the few pilot studies in Finland, Portugal, and Switzerland have not been expanded. In Australia, Canada, Great Britain, Japan, New Zealand, South Africa, and elsewhere, as well as in the United States, the safety and effectiveness of fluoridation are being questioned intensely.

Scientific panels and committees composed of neutral members are also taking issue with proponent thinking. In December of 1978 a government appointed panel of health experts in West Germany recommended against fluoridation on the grounds of potential hazards to health. A year later a special advisory committee to the Ministry of the Environment in Quebec Canada released a highly critical report that earlier had led to the [recommendation of] a moratorium on fluoridation throughout the Province of Quebec. In late 1979, a governor's task force report in Michigan conceded that fluoridation can cause excessive fluoride intake and proposed that local officials make nonfluoridated water conveniently available to persons who might be suffering ill effects.

The mechanical safety of fluoridation likewise poses serious problems. In November 1979 a waterworks error in Annapolis, Maryland, caused a major fluoride overfeed that resulted in acute illness to kidney, heart, and arthritic patients and the officially acknowledged death of at least one person. Other notable instances of accidental over fluoridation with documented adverse health effects have been reported in Hungary, North Carolina, and Michigan. Clearly, fluoridation procedures are not fail safe.

Many other valid objections can also be raised and should not be ignored. Fluoridation is extremely wasteful of a toxic although potentially highly valuable resource. Less than 0.1 percent of the public water supply, is ordinarily used for drinking and cooking, and less than 0.01 percent is consumed by children under age 10 for whom fluoridation is primarily intended. Because water consumption is so variable, there is practically no control of daily dosage. Many people consume several times the amount of water and thus are regularly average ingesting considerably more fluoride than is recommended or even safe.

Fluoridation is also objectionable in the eyes of many because it deprives the individual of the right of freedom of choice in a matter of personal health care. It imposes an inescapable, demonstrably toxic, prophylactic treatment on each person in the community for a noncontagious condition; regardless of his or her desire to be so treated. The water supplier has the responsibility to make the water as safe as possible to drink, not to make it a vehicle to affect the body of the consumer. Clearly, these and other concerns weigh heavily in the minds of those who look carefully into the controversy over fluoridation.

Excerpts from Applied Chemistry, Second Edition by William R. Stine, Allyn and Bacon, Inc. publishers.

