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Fluoridation revisited

Sir, the article *History of water fluoridation* by Dr Joe Mullen (BDJ 2005; 199: supplement) recounts some of the early observations that people drinking from water sources that were naturally higher in fluoride content tended to have lower rates of cavities than that observed in areas that were not naturally high in fluoride content. The problem arises from assuming that fluoride content was the sole variable in these observations. The more sophisticated developments of the role of trace minerals in nutritional science were not understood at the time that fluoride appeared to be the responsible factor. Dr Fred Losee and Dr Basil Bibby re-examined some of Dr Dean's figures in their article in the *New York State Dental Journal* (1970; 37: 15-19), *Caries inhibition by trace elements other than fluoride*. They showed that in cases where tooth decay rates went down in the naturally fluoridated sources, the water was also high in the trace minerals strontium and/or boron, important elements for building strong bones and teeth. Most of the other countries of Western Europe no longer add fluoride to the water supply. It is time for dentists and scientists to revisit this issue with an open mind.

A. Gore
New York City

The author of the article Dr Joe Mullen responds: *The ability of water fluoridation to reduce both the prevalence and severity of tooth decay has been demonstrated beyond all reasonable doubt. Given the evidence of efficacy that has accumulated since Dean's studies of naturally fluoridated communities, it is difficult to explain the success of artificial fluoridation without drawing the conclusion that fluoride is the true preventive agent, and was indeed correctly identified as such the original studies. I agree with A. Gore, however, that certain other elements can affect dental enamel – Selenium, for example, is thought to be the cause of some fluorosis-type staining.*
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In pursuit of truth

Sir, the recent publication on the *History of fluoridation* (BDJ 2005; 199: supplement)

leaves out an important aspect of the past that has critical effects for as many as 150 million Americans. This factor in the history of fluoridation concerns the specific chemical compounds used for the purpose of fluoridation (since to my knowledge no one adds PURE fluoride to a water supply). My peer reviewed published research with Myron Coplan (a senior chemical engineer) has provided repeated evidence of harmful side effects from the use of hydrofluorosilicic acid or sodium silicofluoride that are absent where sodium fluoride is used. In addition, in 1975 Johannes Westendorf (a German chemist) found evidence of biochemical effects of silicofluorides due to the 'residual species' that are formed when these chemicals partially dissolve in water (eg water treated with silicofluorides acts as an acetylcholinesterase inhibitor). Based on my prior research on neurotoxins and behaviour, I was asked to collaborate on epidemiological studies of the multiple side-effects that might be involved. As described in a series of peer reviewed publications, silicofluoride use is associated not only with increased absorption of lead from exposure to environmental sources such as lead paint in old housing, but with other costly side-effects on social behaviours including higher rates of violent crime, substance abuse, and learning disabilities. For a translation of Westendorf and summaries of our work, see:

http://www.dartmouth.edu/~rmasters/AH_ABS. As a result, we conclude there should be a moratorium on using silicofluorides until/unless they have been DEMONSTRATED to be safe. This is needed because these compounds have never been tested for safety and, in 2002, were nominated for study by the National Toxicology Program on the basis of insufficient knowledge of their toxicology. (Nothing is known about that study as yet, which has caused some suspicions given the parallel controversy at Harvard University over the attempted suppression of findings linking fluoridation with osteosarcoma.) Given the habitual refusal of both supporters and critics of fluoridation to consider the difference between sodium fluoride (which has been

tested for safety) and the silicofluorides, these new findings make it necessary to establish a moratorium on using silicofluorides until there is convincing evidence of their safety not tainted by past failures to consider harmful side-effects in an unbiased scientific manner. For a summary of the reasons for this argument, see our editorial published in the journal *Fluoride* (2005; 38: 1-5). As a scientist committed to seeking the truth and public welfare, I will retract or qualify my findings if solid peer-reviewed scientific studies provide convincing evidence of error. (I am NOT an 'anti-fluoridationist', and use both fluoridated toothpaste and dental gel with sodium fluoride). In this spirit, I ask an urgent question: If you know of a peer reviewed experimental study demonstrating the safety of either silicofluoride in water (particularly with regard to effects of residual compounds on biochemistry and behaviour), please let me know.

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The author of the article Dr Joe Mullen responds: *Reviews of the best available evidence have failed to demonstrate any harmful effects from drinking water fluoridated at 1 ppm – irrespective of the compounds used.*

The papers by Masters and Coplan have not been replicated by other researchers and have not found general acceptance in the scientific community. Their model of the chemistry involved has been severely criticised by senior reviewers¹ as have the epidemiological and mathematical techniques used.² These documents are cited on the Centre for Disease Control website www.cdc.gov and give considerable detail on specific profound criticisms of the approach used by Masters and Coplan.

1. Urbansky ET, Schock M R. *Int J Environ Studies* 2000; 57: 597-637.
2. Pollick H F. *Int J Occup Environ Health* 2004; 10: 343-350.

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