



SHOULD WE PUT FLUORIDES IN OUR WATER?

Eight Canadian centres are already adding a chemical compound to their tap water to try to give children better teeth. Several more are about to follow suit. Where does your town stand on this controversy which ranges from loud shouts of "rat poison" to claims that fluoridation's the "greatest thing since pasteurization"?

By DOROTHY SANGSTER

Photo by Panda

TURN ON a tap in Brantford, Ont., pour yourself a drink, and you hold in your hand a glass of the most controversial water in Canada.

Colorless, odorless, sparkling clear, it nevertheless contains one part per million of sodium fluoride. A minuscule amount, but enough to spark off one of the hottest verbal battles in this country today, based on this question: should fluoride be added to drinking water to reduce dental cavities in children?

Those in favor point out that the state of our youngsters' teeth is cause for alarm. In Canada, tooth decay is now increasing six times faster than dentists can provide adequate treatment. Half of all two-year-olds in this country already have tooth trouble. A study of Ottawa school children showed an average of eight dental defects per child. In Ontario elementary schools more than three hundred thousand pupil-days were lost in one year because of dental disorders. Toronto dentists estimate that by the time today's school children reach sixteen they will have an average of ten rotten teeth. One Ontario medical health officer says that if nothing is done this generation of children will have lost half their teeth before they reach forty. The Ontario picture is reflected in similar disturbing statistics across the country.

Is fluoridation the answer, at least in part, to this great health problem? Lined up, the combatants in the debate are:

For Fluoridation: The Canadian Public Health Association, which includes most provincial and municipal health officials as well as university authorities in the field; the Canadian Medical Association and the Canadian Dental Association which recently issued a joint statement embodying typically careful medical endorsement; municipal dental societies, and the Health League of Canada. This is approximately the same line-up of authorities as in the United States where fluoridation, although well established in more than seven hundred communities, is still a controversial issue. Opinion in this group is based on numerous surveys in both the United States and Canada which indicate that a substantial reduction in tooth decay, possibly as high as sixty percent, can result from drinking fluoridated water, and that there is no scientific evidence to date of any harmful side effects of such water if the fluoride level is about one part per million. Enthusiasts go so far as to call fluoridated water "the greatest public health measure since pasteurized milk."

Against Fluoridation: A widely diversified group of people with differing objections. Religious objectors (particularly Christian Scientists) regard fluoridation of public drinking water as enforced mass medication and are therefore opposed to it as an infringement of minority religious rights. Drugless healers, chiropractors and naturopaths object to it as medication. Some people object to fluoridation because they believe dental problems could better be served by a proper diet; other objections

are that it costs too much and its benefits are shared by too few; that the chemical should be contained in milk, or bread, or pills, or toothpaste rather than in municipal drinking water.

"Go slow" advocates fear that the movement is gaining strength too fast and without sufficient research into possible long-range effects on the human body. They point to the report of a committee on nutrition appointed by the Canadian Medical Association stating that "there is a great deal of unknown territory in the effects of fluorine on other parts of the body," and to the conclusions of a committee of the U. S. House of Representatives that "a sufficient number of unanswered questions concerning the safety of this program exists to warrant a conservative attitude."

Caught between the pros and the antis, the average Canadian still doesn't know a great deal about fluoridation. A Gallup poll last June indicated forty-six percent of Canadians questioned had never heard of fluorides. Of the remainder only thirty-five percent knew their correct use. Actually, fluorine is a yellowish gas of the chlorine family. Combined with sodium it becomes sodium fluoride. It is poisonous in relatively large concentration, but medical and dental authorities agree that when added to water in the proportion of one part to a million parts of water, it is quite safe.

Nobody knows exactly how fluorides work on a tooth, but there is considerable evidence of their good effect. Studies of areas in the United States where the water picks up fluorides from underground caverns and rocks indicate that children living there have approximately sixty percent fewer dental cavities than those living in unfluoridated areas—all other things, including diet, being equal. The enamel on their teeth is harder and more resistant to decay. Acids produced in the mouth have to work harder to make holes in such fortified teeth.

Canada's own Brantford survey, now entering its ninth year, suggests that similarly encouraging results can be expected from artificially fluoridating a community's drinking water. Sparked by the Medical Officer of Health for Brant County, Dr. W. L. ("Bill") Hutton, in 1945, the project was envisioned as a ten-year survey. A pre-fluoridation primary school dental survey was done, and in June 1945 a fluoride concentration of between 1 and 1.2 parts per million (PPM)—just a speck in a gallon—was added to the Brantford water supply and has been continuously ever since.

At the same time, Brantford asked the Department of National Health and Welfare in Ottawa to select two other communities as "controls," and the Ontario localities of Sarnia (whose water is fluoride-free) and Stratford (whose water naturally contains 1.3 ppm of fluorine) entered the picture. By including studies of these cities in their survey scientists could reasonably assure themselves that any lessening in tooth decay in Brantford was due to fluoridated

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MACLEAN'S: SEPTEMBER 15 1953 DOROTHY SANGSTER ([Link](#))

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water, and not to some other cause. Standardized techniques were adopted to compare the teeth of children in the three cities, and Dr. H. K. Brown was appointed Chief of the Dental Health Division in 1947 to supervise the entire project. Speaking of the federal government's role, Dr. Brown declares, “Our function is merely to find out the facts and pass them on.”

The findings, commencing with the first series of surveys in 1948, and continuing up to the present, have been encouraging. While the amount of tooth decay among Sarnia and Stratford children, drinking their usual water, has remained about the same, the teeth of Brantford children have become stronger and more decay-resistant than they used to be. Only 5.18 percent of Brantford school children had perfect teeth in 1944, before fluoridation commenced. Now the percentage has risen to 19.4. Dr. Hutton declares that in 1952 there was a forty-one-percent reduction in tooth decay among all school children in Brantford, starting in the five-yearold group with a fifty-two-percent reduction

and going on up to the fourteen - year - olds, who showed a thirty-two-percent reduction. "Fluoridated water has proved its value and Brantford is proud of the results achieved," he says.

Dr. R. M. Grainger, dental statistician of the Ontario Department of Health, estimates that as children drink Brantford water from birth their tooth decay will probably level off at fifty percent less than formerly. In time they should attain the dental health of Stratford children, who have drunk naturally fluoridated water all their lives. (Stratford youngsters have "about sixty percent" less dental decay than youngsters living in a comparable area without fluorine, according to Dr. Frank Kohli of the same department.)

In May 1953 Hon. Paul Martin, Minister of National Health and Welfare, declared in the House of Commons, "The best view is that the addition of fluorine to water supplies in Canada promises not only to be an important event in the history of preventive dentistry, but also one of the most important events in the history of the whole public health field." This summer, Dr. Brown — hitherto guarded in his statements— was deep in preparation of the first long statistical report on the Brantford findings, expected to give encouragement to fluoridation advocates.

Since the Brantford survey was undertaken, five other Ontario communities (Oshawa, Sudbury, Fort Erie, Chalk River and Thoreau) and two in Saskatchewan (Moose Jaw and Assiniboia) have fluoridated their water, and according to Dr. Brown, who recently returned to Ottawa from a cross-country tour, "Half a dozen other Canadian cities are standing there with a shovel, waiting to throw the stuff in."

What's stopping them may be any one of a number of things; reluctance to inaugurate a public-health measure whose immediate benefits are reserved for a minority of the population—children—and whose full results will not be visible for several years; lack of knowledge, and hence of interest, on the part of the public; and organized resistance on the part of what Dr. Cordon Bates of the Health League of Canada calls "a crackpot fringe" who have no hesitation in assuring city officials that fluorides are rat poison, that they cause heart disease, cancer and kidney disorders, sexual frigidity and holes in the head.

That such charges are not without psychological weight is evident from the experience of James McGregor Burns, a writer in the New Republic who recently described "a funny sad tale of fluoridation" in his home town. Burns' community voted for fluoridation early in 1952 (several hundred voters in favor; only four voters against) and drank the water for several weeks before the anti-fluoridation forces got busy. Then things began to hum. Public meetings were called, outside speakers imported to harangue on the dangers of fluorides, rumors spread that the fluoridated water was causing potatoes to turn black, goldfish to die, and housewives' hands to become poisoned." Advocates of fluoridation were labelled "stinker" and "Communist." Finally a secret referendum was called, cars were supplied for voters, and only half the eligible voters in town turned out—to vote out fluoridation and put the machinery up for sale. Burns concludes, "This is an age of fear and suspicion, of big lies and little lies."

In Toronto, where a Citizens' Committee of a hundred and fifty members bitterly fought fluoridation last winter, Dr. W. J. McCormick, a nutritionist who helped organize it, solemnly told me, "You know that fluorine is a rat poison, don't you? It's used for hardening cement. It will take the calcium out of your bones. I have a little grandchild down in the States in a city where they've got this poisoned water, and my daughter writes me that the child's teeth are falling out."

A. E. Homewood, administrative dean of the Canadian Memorial Chiropractic College in Toronto, recently prepared an article in which he included the charges of an American congressman that in

Grand Rapids, Mich., after four years of fluoridated water, the deaths from heart disease had increased by eighty percent, from nephritis by fifty percent and from intracranial lesions (holes in the head) fifty percent. (Enquiry of Dr. W. B. Prothro, Public Health Director for Grand Rapids, brought back the claims that the congressman had achieved his statistics by comparing the death rates for the city of Grand Rapids for 1944 with the combined city and county statistics for 1918.)

At least two private American organizations, the Citizens' Medical Reference Bureau Inc. and the NationWide Campaigner Against the Fluoridation Fraud, are circulating pamphlets in this country, informing Canadians that fluoridation verges on criminal insanity, that its advocates are driven by a "compulsion psychosis" and that putting fluorides in drinking water is the first step towards socialized medicine.

An interesting example of mass fear and prejudice was exhibited in Brantford eight years ago when many people took it for granted that fluoridation would commence on the first day of 1945. After Jan. 1 letters began to rain in on city health officials from nervous citizens who complained that the new water tasted funny, discolored their false teeth, left rims on the bathtub, and "caused fevers." Actually, the fluoridating equipment had not arrived on schedule and Brantford was drinking its usual "pure" water. In April, with letters still pouring in. Mayor Jack Ryan announced the ironic truth. Amid embarrassment, the letters ceased. In June, fluoridation was quietly inaugurated in Brantford with nobody the wiser. This time there were no frightened letters. In September, Mayor Ryan made his second announcement: that Brantford had been drinking fluoridated water for three months with no complaints and apparently no ill effects.

In the battle for and against fluoridation much time and energy are being wasted in personal sniping and namecalling, and wild illogical argument. There is room for sensible argument on several points.

Some responsible opponents fear that fluoridated water will cause mottling of the teeth, leaving them brown and discolored. Those who favor fluoridation assure them that ugly mottled teeth occur only in "naturally fluoridated" areas where the concentration of fluoride is as high as 1.5 to 5 parts per million. They declare that the amount recommended for artificial fluoridation, 1 to 1.2 parts per million, will not discolor anybody's teeth. They admit that a small minority of Brantford children (less than ten percent) show signs of tiny, pearly-white overtones on their back teeth but insist that nobody but a dentist would notice such shading, that the teeth themselves are not harmed by it, and that in any case an almost invisible white mottling on the molars of a few children is more to be desired than a mouthful of cavities and false teeth at forty for all of them.

Some of the most vigorous opponents of fluoridated water simply feel that although it may offer a solution it's the wrong solution. They insist that all our attention ought to be focused on proper diet; that instead of trying to protect our teeth against candy and sweet drinks and refined carbohydrates, we ought to be shunning such foods in favor of natural cereals and raw fruit and vegetables.

Defenders of the fluoridation scheme admit that diet is the best answer, but doubt that the nation is going to change its dietary habits overnight. Dr. Kohli says, "Certainly if refined carbohydrates were eliminated from the diet, and people ate selected foods, their teeth would have fewer cavities, just as if people didn't go in swimming, they wouldn't be drowned. But they do, and they are. So something has to be done from the realistic viewpoint." Even the staunchest advocates of fluoridation do not claim that it will cure dental disease. They say it is simply a preventive, to be used along with frequent brushing, proper attention to existing cavities, and as much abstinence from soft foods and sweets as possible.

Until recently, certain industries — notably brewers, bakers, wet milling operators and manufacturers of soft drinks—feared that fluoridated water would ruin their product, or at best fluoridate it above the allowable limits set up under the Food and Drugs Act.

The American Institute of Baking has stated that the addition of fluorides in concentrations up to ten parts per million in sponge and dough water has no effect on bread; the president of the Master Brewers of America declares in Toronto that the amount of one part per million in drinking water, as is recommended, doesn't worry brewers; and Canadian soft drink manufacturers say that their product, if made with fluoridated water, would contain no more fluorine than the water itself; that is, well under the two parts per million allowable under the Act.

A good deal of the objection in business and industrial circles is based on the feeling that it's wasteful to pay for fluoridating a city's entire water supply when only a small amount, of that water is used for drinking purposes. (Brantford's equipment cost \$448 to install and the cost of the chemical this year was \$5,800. For a city the size of Toronto the estimated installation cost is \$3,000 and \$90,000 a year for the fluorides.)

Fluoridation advocates reply that expensive as it may seem (and actually it's estimated at from twelve to seventeen cents per person per year, once the initial expenses are met) it represents a considerable saving in dental bills and that there's no other way to meet the problem. It's impossible to fluoridate part of a community's water supply. And water is a natural carrier of fluorides, and hence the best medium for carrying them artificially. They assert that milk would be unsuitable, since it is unevenly available to children in different economic levels, its community cost would be higher, the procedures for determining fluoride in milk are not simple, and its sale in areas where the water supply is already naturally fluoridated would present a hazard. They oppose putting fluorides in pills or powders, as some members of the opposing camp suggest, and letting individual parents spoon out the appropriate amount to their youngsters, since careless parents could either neglect the job, or else mistakenly administer a possibly fatal over-dose. Would-he manufacturers of fluoridated chewing gum, candy bars and soft drinks have all been discouraged by the Food and Drug Division of the federal government because of a similar impossibility in controlling the amount that careless purchasers might choose to swallow.

Many objectors to fluoridated water would have no objection to topical fluoridation: that is, the direct application by a dentist of a two percent solution of sodium fluoride onto a child's teeth. Why isn't this the answer, they wonder.

Unfortunately, although topical application is claimed to reduce the incidence of tooth decay by as much as forty percent, it is extremely time consuming (teeth must be painted several times, and at four different stages of tooth development), and many school dentists feel they're better occupied filling the cavities that children already have, rather than ensuring them against future ones. Actually, topical application is a job for dental hygienists, such as those who are presently doing mobile clinic work in rural Saskatchewan and down on Prince Edward Island. However, Canada has only a few dental hygienists, not nearly enough to go around. The chances of all of our city children obtaining their fluorides by the topical method appears downright impossible. Topical fluoridation will have to be the answer for children living in rural areas where fluoridated city water doesn't reach.

Another argument against topical application is that dentists now believe that if a child drinks fluoridated water from birth, at which time the enamel on his permanent teeth begins to calcify, he stands a better chance to avoid tooth decay than if he waits and has the fluoride painted directly onto the outside of the teeth once they've erupted from the gums. Fluoridated water promises to affect a child's teeth in their formative stage, according to Dr. Brown.

Of all the arguments against fluoridation, the one that appears to merit most serious attention is the charge that water treated with sodium fluoride may induce dangerous side effects on the human body.

Fluorine is no stranger to our diet. Beef contains 2 ppm fluoride; pork 1 ppm; lamb 1.2 ppm; canned salmon 9 ppm; codfish 7 ppm, and fresh mackerel more than 25 ppm. Tea is not considered toxic within the Food and Drugs Act of Canada if it contains as high as 100 ppm fluoride (The Act permits not more than 2 ppm in most manufactured foods or drinks). Whether they know it or not, thousands of Canadians have drunk naturally fluoridated water—that is, water which has picked up some fluorine from underground caverns and rocks—all their lives. Spot analyses of wells across southern Alberta show that a large number of wells contain fluoride naturally. In Ingersoll, the natural fluoride content is 1.8 ppm, considerably higher than is artificially recommended. In the United States, more than three million persons have drunk naturally fluoridated water for years, in concentrations from 0.9 to 5.1 ppm. More than seven hundred other American communities, including cities like Miami, Minneapolis, Baltimore, Washington, Schenectady, Pittsburgh, Rochester and Philadelphia, have added the chemical artificially to their water supply.

So far as is known, no seriously harmful side effects of any kind have yet been noted from drinking water containing from 0.9 to 5.0 ppm of sodium fluoride. The only undesirable consequence has been mottling in areas where the natural fluoride content exceeds 1.5 ppm. Vital statistics from both naturally and artificially fluoridated areas reveal no long-term detrimental effects. Studies indicate that the human body has a very efficient mechanism for eliminating fluorides. Dr. Hutton says, "You'd have to drink sixty gallons of water at one sitting to get a dose which would be slightly poisonous."

In other words, it's the quantity of fluoride in our diet that matters, and what scientists call the "trace element" of 1 ppm in a community's drinking water is considered perfectly safe.

On the other hand, as the Canadian Medical Association's committee on nutrition points out, there's a great deal of unknown territory on the effects of fluorine on other parts of the body. Can fluorine, which appears to be safe in a 1 ppm concentration, cause any kind of trouble when taken every day every month for a long period of years? Is it possible that naturally fluoridated water contains some trace element of another protective element that is missing in artificially fluoridated water? Can fluorides be injurious to persons working with the chemical? If a community's drinking water is fluoridated, should the other fluorides in people's daily diet be adjusted accordingly, so that the overall amount of the chemical taken into the body is not dangerously toxic? Do any human beings have a "low fluoride tolerance," and if so, what can be done to protect them when their community inaugurates fluoridation?

Advocates of fluoridation in Canada, and they include most responsible authorities in the field of dentistry and public health, apparently accept the statement of Dr. W. B. Prothro, public health director for the city of Grand Rapids, Michigan, that "Fluoridation has been out of the experimental stage for the past several years and there is an abundance of convincing scientific evidence to demonstrate its effectiveness, harmlessness and economy." They see a tremendous need for something that will combat our growing dental problem: fluorides have proved their value in this regard, and they feel that for lack of any evidence to the contrary, they can be presumed to be safe. Apparently British authorities agree, for a government report, based on the findings of a visiting team of chemists and dentists to the U.S.A., recommends that fluoridation be adopted in selected areas of Britain, using the 1 ppm level.

However, the general public will be apt to breathe easier if the recommendations of the CMA's committee on nutrition are adopted: namely, that where artificial fluoridation of a communal water supply is undertaken, the entire program must be conducted under close engineering, dental and

medical supervision, and accompanied by scientific studies to make sure that no unanticipated damages turn up.

Only when this is done, and several long-term studies have been completed, will the battle for and against fluoridation be scientifically settled once and for all. ★