



An opponent of fluoridation speaks up at town meeting in Dover-Foxcroft, Maine, where the plan recently was voted down for the third straight year.



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In New York City, which does not yet fluoridate its water supply, 13,000 youngsters a year receive "topical fluoridation" treatments—i.e., their teeth are swabbed with fluoride.

## **The Fight Over Fluoridation**

The water-treatment plan to prevent tooth decay splits our towns right down the middle. This battle is waged amid name calling and predictions of doom . . .

## By J. C. FURNAS

Five years ago the curtain was raised for the performance of a dental miracle. The United States Public Health Service put its fluoridation show on the road at that time, recommending the addition of tooth-hardening fluoride to drinking water in all communities where that chemical was not naturally present in the water supply.

The promise was a new generation of Americans with less tooth decay instead of more. Competent scientists had ample proof that fluoridated water could prevent approximately two thirds of the tooth decay among children. They had checked the health of thousands of individuals of all ages, first in areas where the chemical was naturally present



N.Y.C. Water Commissioner Arthur Ford is dead-set against water fluoridation.



N.Y.C. Board of Health's Dr. Haven Emerson calls fluoridation's opponents "nitwits."

in the water supply, and then in places where it had been artificially added. In urging fluoridation, the health arm of our Federal Government had the backing of the American Dental Association, the American Medical Association, the American Public Health Association and the National Research Council. All have passed resolutions backing the idea.

Science, it seemed, had moved in on dentistry with a "wonder chemical" to match the drugs that have whipped a long list of diseases in medicine. Fluoridation didn't promise a cure, but it did suggest a sizable drop in dental ills and dental bills, now topping 1,200,000,000 a year, for our children. The adult population got no promises at all.

That was five years ago. The promise is still there, but hardly for the next generation. Fluoridation is having trouble on the road—so much so this past year that, according to the calculations of one pessimist in the Public Health Service, 279 years will pass before this tooth-saving technique is adopted by all the towns and cities where it is feasible. Other estimates now range from 50 to 100 years for a job that originally had a thirty-year goal.

Philadelphia, Pittsburgh, Baltimore, Washington and San Francisco have already gone for fluoridation. If New York and Chicago both install it in 1956, which is likely, 34,000,000 Americans will have it. Yet bills to ban the whole idea have been introduced in Congress. Local law- Is suits to bar it continue to crop up.

At least 70,000,000 of us whose towns need and could have fluoridation, lack it. Cincinnati, Birmingham, Akron, Seattle and San Diego have rejected it or dropped it after trial. College-dominated towns, presumably with high average I.Q., have said, "No, thanks." A slim majority of L the 250-odd places, large and small, holding referendums have voted it down. And the head of the municipal water department in Batavia, New York, is so hot against it that he prints antifluoridation propaganda on the town water bills.

"Fluoridation" obviously has become a fighting word. Any day now—if not already—it can start an argument in your home town. Is Dr. Bernard C. Kingsbury, president of the American Dental Association, justified in branding cities that lack fluoridation as "failing in their responsibility to the public"? Or should you believe Dr. Frederick B. Exner, Seattle radiologist and conspicuous enemy of the idea, who says it "violates the most sacred rights of God and man"? What are the facts?

The bone of contention is fluorine, a superactive chemical element never found pure in nature, always tied to other elements in compounds known as fluorides. Sodium fluoride, in massive doses, is a tough rat-and-insect poison. Small amounts of sodium fluoride, and other fluorine compounds, are also usual in human diet—strong in tea and sea foods, detectable in subtraces in most of what you ever ate or drank.

The blood stream, in youth, leaves sub-traces of fluorine in the enamel and dentine of your teeth. Decades of research have yet to tell doctors why just enough fluorine discourages cavities. The positive causes of decay are still obscure. Heredity is one; too much sweet stuff, poor nutrition and poor home care are others. Just enough fluorine helps teeth to resist decay, however caused.

More than "just enough" may cause "Texas teeth"—milky-white spots in the enamel, often turning mottled brown, common in parts of Texas and Colorado which have water with high fluorine content. Search for the cause of this mottling led to the discovery that local teeth also showed unusually little decay. "High" fluorine content is actually absurdly low, running from two to eight parts per 1,000,000 of water. Mottling disappears

below two parts per 1,000,000, the decay braking action keeps on well down toward one half part per 1,000,000.

Such observations led researchers to determine that one part per 1,000,000 is best to achieve fewer cavities with a low risk of mottles. This also happens to be the natural fluorine content of I seawater, the medium in which life first developed. Lucky places, like Aurora, Illinois, and Amarillo, Texas, have water naturally near that level. Others, with too much, like Bartlett, Texas, actually take fluorides out of the water to guard against mottles. But the drinking water in most towns has too little fluoride to help teeth much.

The idea of artificial re-enforcement of fluorine-weak water naturally followed. To test it, state and Federal agencies chose two pairs of guinea-pig towns with fluorine-poor water—Grand Rapids and nearby Muskegon, in Michigan; Newburgh and nearby Kingston, in New York. For ten years, starting in 1945, Newburgh and Grand Rapids had one part per 1,000,000 of sodium fluoride added to their water. Kingston and - Muskegon stayed on their usual water. Query: After ten years how much difference would there be between the teeth of children in the towns with fluoride and e those in the towns without?

The results were so striking by 1951 that the Public Health Service recommended fluoridation wherever indicated. Large and small communities took it up. That same year Muskegon decided it couldn't afford to wait out the full ten years without fluoridation, experiment or t no experiment, and added the chemical to its water supply. Kingston stuck it out for the pay-off. I was present last December when the final reports were read before the New York Institute of Clinical Oral Pathology—and they held the miracle promised for cavity-plagued kids.

Fluoridation had worked. Newburgh children showed 58 per cent fewer decayed, filled or missing teeth than did Kingston children. Their cavities were smaller. The sharpest contrast was where it should be—in the teeth of those born after fluoridation began, who had been drinking one-part-per-1,000,000 water all their lives. And so far it was safe. Elaborate physical exams, including spinal X rays - to detect abnormal deposits of fluoride in the bones, showed no significant differences in the kids in either town.

The same day Canada's province of Ontario announced a ten-year study in some ways even more clinching: This had included Sarnia, a town with fluorine-weak water left untreated; Stratford, where the water had a natural content of 1.2 parts per 1,000,000 of fluoride; and Brantford, where the fluoride was artificially added. At the start of the experiment, in 1945, the children's teeth in Sarnia and Brantford had about the same prevalence of decay, much worse than that of the children in naturally fluoridated Stratford. In 1955, Sarnia's kids were as badly off in cavities as ever. Stratford's were as well off as ever. But in Brantford, where the fluoride had been added for ten years, the youngsters' teeth were now up in the Stratford class.

After reading the news from Canada and New York, Mayor Donal Connolly, of Trenton, New Jersey, said now was the time to consider fluoridation for Trenton. Here and there his judgment has been, and will be, followed. But no one expects a stampede. For the opponents of fluoridation have counterattacked on a nation-wide front.

The opposition cross-sections like poor bacon: The streaks of logic, responsibility and good will are almost lost among layers of irresponsible hollering. Those openly dubious about fluoridation do include one of the nation's most eminent surgeons, several able biochemists and a few other medical specialists, dentists or researchers of impressive background and standing who object on a rational basis. But mostly the movement generates heat rather than light.

Doctor Exner's remark about violating the "sacred rights of man and God" is a clue to emotions aroused against fluoridation "The stuff may be good for kids," an intelligent friend of mine agrees. But, he adds, "It won't help me or millions of other adults. Maybe it won't hurt me either. I don't care. What I resent is a bureaucrat forcing the stuff down my throat."

The threat to personal freedom, whether real or fancied, has prompted a few journalists, of whom George Sokolsky is best known, to toy with backing the antis. Here and there local chiropractors take the lead. In the shadows below them mills a confused anti group—and I mean confused—of doctors, dentists and technicians of tenuous professional standing, but skillful at using technical double talk. These are joyfully leaned on and quoted by well-meaning food faddists and out-and-out cranks to prove that fluoridation is a sinister risk. In 1954, a witness before a House of Representatives committee seriously warned its members against bathing in Washington's fluoridated water. To avoid drinking "rat poison," some of his fellow witnesses had fetched jugs of "natural" water from home.

Still further down, and fortunately less numerous, are the chronic hatemongers, who package antifluoridation in with their other scurrilous campaigns. From them the cranks borrow outlandish tales for use in local letters to the editor and for propaganda mailings. A popular target has been Oscar R. Ewing, who was head of the Federal Security Agency when the Public Health Service, then under FSA, decided to urge fluoridation. During World War II, before he became a public official, Ewing's law firm assigned him to Aluminum Company of America's defense contracts. Out of these two facts came the antis' story that he was paid S750,000 a year to foist fluoridation on the nation so Alcoa would have a market for its spare fluorides.

Actually, though fluorides are used in refining aluminum, those sold for treating water come largely from the chemical-fertilizer industry. In any case, it takes real imagination to cast this confirmed New Deal lawyer as a "tool of the interests." You need imagination, too, to go along with another familiar accusation that the I "sugar interests" are the villain. The claim here is that mothers, once they are convinced that fluoridation eliminates risk of cavities, will no longer ride herd on Junior's overconsumption of r sweet stuff, so more sugar will be sold.

"Have we so coddled our children," asked a witness at that 1954 hearing, "that we are willing to shorten the life of our neighbor so they can have an extra candy bar?" Actually no dentist or public-health official ever depicts fluoridation as superseding good dental hygiene—including temperate use of sweets. Fluoridation is just one device in a battle requiring all possible weapons.

Or take another accusation: This is a plot not of big business, but of communism. Some crusaders advance those two theories simultaneously without spraining anything. The idea is to equip American water supplies with fluoridation gadgets and heavy stocks of sodium fluoride so that, come the great day, a twist of a saboteur's wrist can dump killing quantities of "rat poison" into our large cities' drinking water.

The American Water Works Association says that the size and design of such machines and the small amounts of fluoride stocked make this nonsense. Far from approving fluoridation, communists hotly oppose it as "a

potentially dangerous step forced upon Europeans by American capitalists," according to a dentist recently visiting Germany for the State Department.

A technique for deflating crank reactions has appeared in such forehanded towns as Charlotte, North Carolina, Martinsburg, West Virginia, and Newburgh. City Hall announces that fluoridation will begin on a certain day people in Charlotte recalled later that it was April first—and lets the complaints roll in. "This water is ruining photographic negatives." ... "It killed my goldfish." ... "It brought grandma's asthma back." ... "It don't mix good with liquor no more." The newspapers print much of this. Then City Hall announces that, regrettable as these things are, fluoride can't be the cause—the actual start of fluoridation has been postponed for technical reasons to the first of next month.

Mention of these errors in timing annoys even the well-meaning antis like myintelligent, freedom-jealous friend. All the more reason, they feel, to accuse public health agencies of cynically using fluoridation as an opening wedge for mass medication and socialized medicine. They cannot explain why, in that case, the American Medical Association, to which socialized medicine is anathema, formally approves the principle of fluoridation.

It is also highly suspicious to some antis that the American Dental Association is keen on a scheme which obviously takes business away from dentists. The fact is, of course, that dentists want tooth decay reduced because there aren't nearly enough dentists for the nation's present needs. They'd like to concentrate more on preventive mouth medicine, such as tooth-saving gum care and correction of malocclusions, instead of grinding away forever as repairmen.

The more rational objections to fluoridation are a mixture of half truths sewn on whole cloth and, finally, some completely honest, legitimate doubts that our scientists have marshaled all the facts. Much uneasiness has been roused by accusations like the following on local radio, in town meetings and at service-club lunches. Let's run through those widely used, with antidotes attached.

- Sodium fluoride is "rat poison." (True; so what? In the same sense the chlorine mixed into drinking water to protect you from typhoid and other water-borne infections is also poison. "Poisonousness" depends on "how much?" as well as on "what?". "Most medicines administered by physicians are poisonous if given in high concentration," says Dr. Alton Ochsner, the great New Orleans surgeon, who opposes fluoridation but on grounds sounder than any mentioned so far.)
- 2. Fluoridation is "unnatural." (If this is reprehensible, better leave the chlorine out of the water too.)
- 3. It is "forced medication." (Hardly. You don't have to drink city water any more than you have to ride cityrun buses. You can always walk or buy bottled water. And fluorine, present in most waters and foods and all teeth, belongs in normal diet and normal bodies. Hence fluoridation is not "medication," but a supplement making up a deficiency in diet—like irradiating milk to step up its content of Vitamin D.)
- 4. It might accidentally dump dangerous amounts of fluoride into city water. (It can't, for the same mechanical reasons mentioned above to rule out the notion of communist sabotage.)
- 5. Only 1 per cent of city water gets swallowed. It's wasteful to fluoridate the other 99 per cent. (Facts good, conclusion pointless because fluoridating 100 per cent costs so little—five to ten cents per year per capita in many places; never more than a quarter.)

6. The one part per 1,000,000 "safe level" is based on averages. Heavier-than-average water drinkers will get far more fluorine daily. And how about most of us in hot, thirsty weather? (Recognizing this, fluoridated Southern towns drop the level to .7 parts per 1,000,000 in summer. This is done to avoid mottles in the teeth of growing children. For the rest of us the precaution may be needless. Biochemists are confident that, at any conceivable levels in water supply, the more fluorine the body takes in, the more it gets rid of in urine and sweat. The slight difference between intake and outgo stays behind in teeth and bones. To get a massive, harmful dose of fluoride, you must drink several bathtubfuls of water at a sitting.)

As you can see, these six objections are, in the main, easily rebutted. But that slight difference between intake and outgo—mentioned in No. 6—keeps a few eminent doctors and nutritionists uneasy. They admit fluorine is a real and valuable fighter against tooth decay. They are aware that careful studies in one-part-per-1,000,000 towns like Aurora indicate no ill effects from water-borne fluorine on people born and living there all their lives. As intelligent men they want no part in the shrieks of "Rat poison!" or "Conspiracy!" But Prof. Clive M. Mc-Cay, of the New York State College of Agriculture at Cornell University, recently told a radio audience:

"Evidence is not convincing that the cumulative effects of fluorides may not produce injury in people after long drinking of fluoridated water." Doctor Ochsner, member of a New Orleans committee studying the issue, says he is "not convinced that [fluoridation] is entirely with-out danger." He is specially alert to the possibility that, though fluoridated water spares Junior much decay, it may also so affect the gums of adults continuing to drink it that they will lose their teeth needlessly early. Both these doubters would feel better about extra fluorine as an antidecay weapon if Junior ceased get-ting it when his teeth have matured. They have their counterparts abroad. Several noted nutritionists are violently opposed to the British Health Ministry's proposal to fluoridate water supplies. The Institute Pasteur, in France, has refused so far to approve a fluoridation program.

The National Institute of Dental Research suspects that the antidecay action of fluorine persists well into middle life. But at best it is a decreasing return. By the age of sixteen Junior has certainly had 90 per cent of possible benefit. So, to keep fluorine where he thinks it belongs, and to make it unnecessary for adults to keep on drinking it, Professor McCay suggests specially fluoridated sugar, so that Junior, and Junior alone, will get an equivalent of that water-borne one part per 1,000,000. Doctor Ochsner leans to the more usual suggestion of fluoridating Junior's milk.

Such hopes of getting the best from fluorine without treating whole water supplies tie in with the great weakness of fluoridation as a public-health tool: It omits two fifths of the nation—the 60,000,000 people using wells and other private water supplies. The Public Health Service hopes soon to fill this need with a safe and cheap home fluoridator. Until their experiments bear fruit, the best accepted answer is "topical fluoridation." This means directly swabbing the enamel of children's , teeth with fluoride, so that it penetrates tiny crevices and reacts with enamel in a protective hardening. The formula is a series of four treatments repeated every three or four years to catch new teeth as they appear. It works, too—not so well as fluoridated water, which can do much for the teeth via the blood stream before they f "erupt," but well enough to be worth while.

New York City thus treats 13,000 children a year. Michigan's "topical" clinics processed 32,000 in 1955. Most dentists do it privately on request. Cost per child is higher than that of fluoridated water. The dentist's bill may

be almost as much t as if he had waited to fill the cavities that I the job may prevent. But Junior has been spared much grief. Group treatment, using teams of dental hygienists or student dentists, can get it down to three dollars per series.

The same theory of "topical effect" underlies tooth pastes containing fluorides. The newest of these, based on the research of Prof. Joseph C. Muhler, of the Indiana University School of Dentistry, uses a tin fluoride that seems to discourage decay in adults almost as much as in children. It is being marketed under United States Food & Drug Administration reservations about use on very young children and in areas with high natural fluoridation in water. The American Dental Association, claiming "no adequate evidence" showing prevention of tooth decay, says, "It would be a disservice to the dental health of the public if the promotion of fluoride dentifrices should lead to the misconception that their use is an adequate substitute for the controlled fluoridation of municipal um water supplies."

Fluoridated chewing g um also has been tried. Most current schemes for the neglected 60,000,000, however, amount to a do-it-yourself approach via the blood stream. Tablets that give Junior the daily equivalent of one part per 1,000,000 in his drinking water have been tried. The city council of Newark, New Jersey, recently requested the city health authorities to supply such tablets free to parents asking for them. The New Jersey State Department of Health refused to sanction the method. The Public Health Service also has small faith in once-a-day tablets. Fluorine works best, they think, with frequent intake, as in drinking water.

Ever since the early days of fluoridation, some of the National Institute's experts privately dosed their own children's drinking water to the one-part-per-1,000,-000 level. The water supply in their Maryland community was not fluoridated until recently. For amateurs it is safer to buy naturally fluoridated water now shipped commercially out of the city mains of Hereford, Texas. But the Public Health Service still thinks the community water-supply technique best. Bottled water costs too much for many families. It's difficult to be sure that Junior drinks largely from a special source.

This pessimism is probably justified. People even neglect to boil drinking water during contaminating floods. Both the sugar and the milk schemes suffer from the wide variation in children's liking for these items. But there may someday be a lively future in the findings of Dr. James H. Shaw, of the Harvard School of Dental Medicine, that the teeth of East Indians using sea salt have about as few cavities as if they had been reared on fluoridated water.

Sea water contains about everything under the sun in tiny proportions, including fluorine. Use of sea salt certainly can-not be recommended as a public-health measure without far more exhaustive testing than it has yet even begun to have. But if you live in a fluorine-poor situation and want to try it on your kids, it can't possibly harm them in quantities normal in seasoning their oatmeal, tomato juice, vegetables and such. And you don't have to go to the shore to boil down your own supply. The stuff is already commercially available in limited quantities.

Someday some such approach to ad-ministering fluorine by age groups might replace fluoridation. But for now, even Professor Muhler, father of that likely toothpaste, considers water-supply treatment the best answer wherever practical. Put it this way: I have been through these pros and cons more thoroughly than most laymen. if I lived in Kingston, where, the great test being completed, fluoridation is now being

considered, would I be for it? I would. My common-sense reasons, in addition to the six rebuttals already offered, are these:

- Those ten-year results are massively impressive.
- The more responsible an opponent of fluoridation is, the likelier he is to admit that it does prevent cavities as per invoice.
- The possibility of cumulative damage from adult fluorine intake strikes me as too slight to justify rejecting the known benefits for youngsters.
- Tooth decay, next to the common cold, is civilization's most prevalent disease. Fluoridation, to date, is the only method science has found, and proved, to limit this disease in great masses of people. It promises a miracle which is already too long delayed.

THE END