

**Dr. Francis A. Arnold, Jr.**  
**Third Interview**

Date: September 16, 1964

Interviewer: Dr. Wyndham D. Miles

**Q:** You were talking about this Grand Rapids Study the last time we ended up.

**DR. ARNOLD:** As a preliminary to the Grand Rapids Study and what we will go into today, if I'm not mistaken, we did review up to date the background of the so-called eight suburban Chicago communities and the studies that were related to the effect of natural fluoride water, as far as tooth decay is concerned. These studies followed on with what became known as the "21 cities studies," including more fluoride and non-fluoride areas, and including a broader scope geographically of cities in the nation, some with and some without fluoride. This really represented the period up through about 1942, leading into possibly 1943.

It was along about this time that the evidence became so overwhelming relative to the effect of natural fluoride waters, in their affecting reducing tooth decay or dental caries, that the natural next step in thinking, from the scientific standpoint was testing on a research basis the possibility of treating of water that had little, if any, fluoride in it. For practical purposes, it was fluoride-free water, and treating this up to an optimum level for caries reduction, but also an optimum level from the standpoint of mottled enamel. In other words, we had enough fluoride in the water to reduce caries and not too much to the point of having so much that we would produce mottled enamel. This is the area. We knew from our studies that this would be a water in the range of between one and two parts per million of fluoride. The greatest weight of the evidence was that it would be in the range of around one part per million. It would be very effective in reducing caries.

So discussions got under way in the [Public Health] Service as to where this could be done, how we should do it, actually who should do it, and where it should be done. After several conferences with, well, I can remember people like Dr. Joe Mountin, who at the time was head of the Bureau of State Services, who would be involved in this from the standpoint of it was a control measure, would end up as a control procedure rather than a straight research procedure, were it successful.

And there were a number of people at the time that thought the Public Health Service should actually proceed forthwith in recommending fluoridation of water supplies. NIH, particular Dr. Dean, myself and Dr. Dyer at the time, and others with scientific backgrounds may be considered to be more conservative, felt that first we had to actually prove the fact that treating a water would produce the desired results.

There were other factors to be considered, of course. Because, even though natural fluoride waters produce the beneficial effect, and it was natural to assume there was no difference in the natural fluoride waters than one that would be treated up to a similar level, as far as adding fluoride salts to the water is concerned. There were such factors, even practical factors, as cost, matters of concern as to how well it could be controlled. All the advice we had at the time was that it could be readily controlled.

The addition would be within very narrow limits and would not vary from day to day, but there had been no testing of these procedures. And there was, even at the time, from a scientific standpoint, the theoretical possibility that these natural fluoride waters carried some X-component that was not even analyzed for that was always present in a fluoride water, but would not be present in a non-fluoride water. The likelihood of this was rather slim, of course, but from any scientific standpoint, you never

know the negative; you only know the positive. So we had a series of several discussions within the [Public Health] Service, bringing in prominent people for discussion of potential toxic hazards of such a procedure.

The consensus of opinion was readily reached to the point where there was no doubt in the Service's mind and those people that looked into the matter, no doubt about the toxicity. There was no doubt in their minds that the addition of the fluoride to the water would be innocuous in terms of production of any untoward systems or disease factors that weren't prevalent. Because we had enough laboratory evidence and by animal experimentation, we had volumes of papers and knowledge relative to health conditions of people living in natural fluoride areas, in areas such as has been mentioned before in our conversations, as Aurora, Colorado Springs, where actually you had gone through generations of people using much higher concentrations of fluoride in the water.

So the decision was made at that time that, yes, the Public Health Service would put on a clinical experiment. This, I think, was a major decision, because you were exposing, intentionally, roughly large groups of people. It had to be done on a large basis if it meant anything, and you were tampering with the water supply of a community. The whole problem of so-called human rights and who has police power on water supplies, who is responsible in terms of anything should happen, these matters were all very seriously discussed.

I think the most unfortunate thing, as we look back today and hear all the claims of the anti-fluoridation people, was that most of these conferences were informal discussion and no real formal record was made of the discussions and the people there. It's obvious what the decisions were after the meeting, I think should be obvious to anybody, that the Public Health Service and the people responsible, and higher echelons were not going to let us go and dump fluoride in the water unless they were assured that it was a safe procedure. Anyhow, the decision was finally made about in 1943 to proceed.

The next step, of course, was to decide where, what community, where would you do this. The first decision was that we had done a lot of our previous work in, generally speaking, the Grand Rapids area, particularly around the states of Michigan, Illinois, Indiana, Ohio, and we had a lot of knowledge of water supplies in that area, both for fluoride and non-fluoride. They did represent an area that is often spoken of as typical mid-American or typical American communities. We, of course, right off ruled out a place like the city of Chicago, because the cost of doing something like that in the city of Chicago and managing it was tremendous.

At the time we were hunting for a community of some 25,000, 30,000 people, which could be spoken of as representative socio-economically of the American nation. We surveyed several communities in Ohio and Michigan, Illinois, even up toward Wisconsin. Of course, then a couple of communities became interested themselves, and there was a matter of a little bit of politics creeping into the thing. As certain communities, progressive, shall we say, communities, as we look at it from our standpoint, as the health officer may have seen the light and the potentiality, he became interested.

And so we had some people who wanted it in their communities. Of course, on the other side of the fence, we had certain communities that weren't too interested in getting into something like this. But again, I hope that someday we can go back and get some of the letters out of the Archives that were written on this, because a lot of them were personal letters and they're harder to find in the files. Many of them were personal letters to Trendley Dean. I've seen some of them and know where they can be retrieved, where one group would be interested and the other group wouldn't and their reasons why.

The end result of the survey of communities that might be interested and where it could be done was

the decision to fluoridate the city of Grand Rapids and to use the city of Muskegon as a control. The unique features here were that both communities got their water from Lake Michigan. The intakes of their water were in the same proximity in Lake Michigan. I forget just exactly how far apart they are, but it's minor. They were taking even from the same side of Lake Michigan. Neither of the two communities were fluoridating their water. Their water treatment was quite comparable in terms of what they were adding and in terms of the amount of chlorination and the amount of lime and other things that are added to a water supply to make it supposedly potable and useable. Grand Rapids was finally chosen as the community to fluoridate.

I'm not so sure I can decide just exactly why Grand Rapids was the one that we decided to fluoridate, rather than Muskegon, because Muskegon was a community of around 40,000 at the time, and Grand Rapids was a community of around 130,000 to 140,000. In other words, Grand Rapids, from an economic standpoint, was a little larger than we wanted to get into. It cost us more money to run the study. It would have been cheaper to run the study from that standpoint, just on the basis of the amount of fluoride you were buying, because the Public Health Service had decided that we would furnish the fluoride to the community. In round figures at the time, the fluoride was costing us ten cents per capita per year, putting it on the basis of population. So, a 40,000-population community cost us about a third of what it would cost us in Grand Rapids.

But there were certain other features that favored Grand Rapids. Not being disparaging to Muskegon, Grand Rapids had a more modern water filtration plant, had a much better trained superintendent of Water Works, by chance. He was a college graduate and was a well-recognized man in the field of Water Works treatments internationally. He was one of the top figures nationally in the Water Works Association, and they could furnish us very adequate laboratory facilities at their plant. Muskegon had a good plant, did just as good a job of treatment of the water, but did not have quite the added features that Grand Rapids had. Grand Rapids had a somewhat more stable population than Muskegon. You must realize we were into the war period here, and populations, even at that time, were shifting due to industry and all. Muskegon was being particularly influenced by industry.

It was more of an industrial town than Grand Rapids and was being a little more influenced from the influx of population, from the total industrial area around the Great Lakes, Chicago, so forth, than was Grand Rapids. That was another point of consideration for choosing the more stable population, knowing that we were faced with the war situation, knowing we were faced with the costliness of moving populations, because you start examining a kid in the first grade and you want him there when he's in sixth or seventh grade. If he's not there, he's cost you money, because you have lost all your records, in effect, on him, from a standpoint of a longitudinal study, anyhow.

Anyway, the decision was to go ahead with Grand Rapids. Of course, this decision was made after discussions with the mayor, the city manager, the Water Works superintendent all the officials of Grand Rapids, the State Health Department people, and the University of Michigan. These were the major people who were cooperating in the study with the Public Health Service, and we had agreed to conduct the study.

The actual examinations got started in the fall of 1944, shortly after school opened. Our team was pretty well on hand when the children got back to school and preliminary arrangements had been made through the superintendent of schools' office and all. As soon as the teachers were back and the principals were back, then we went up and let the people and the press know what was going to happen in Grand Rapids and Muskegon, too. This was decided sometime back in latter 1943, it was hoped, and we actually thought, that we would have the equipment for adding fluoride to the water would be in operation within a few weeks of when school started, we'll say in October or so, no later than November. We so announced this in the press and otherwise, and we started our study accordingly.

Well, as things happened in the war, delivery of equipment did not always come through when you thought, and you ran into the problems of priorities on specialized equipment and things that had not as high a priority as building our airplanes and things needed for defense and for the war. So they didn't get started. Our examiners did get started, though, we had five examiners in the field, together with five recorders, and we had opened up and rented space for a regular field office in the city of Grand Rapids. We did our work out of Grand Rapids, driving over to Muskegon, this was about 30, 35 miles away, for the examinations there. Since the group was living in Grand Rapids, they commuted each day between the two places, with an occasional exception when there were things to do in Muskegon, they stayed over in hotels and so forth.

Everything proceeded according to description of the examinations, which is a matter of record in the literature. I think some of the things that were interesting then that do not show up in the printed record, we knew enough about the problem to realize that when you're fooling around with people's water supply, you're fooling with something that is highly sacred to some people, you might say. So we expected some flareback. There was a discussion of this line, along with the press and the officials of Grand Rapids and Muskegon, whether you should announce this thing or not. This has been a matter of discussion and philosophy of programs of this sort that have occurred in many, many communities since. The decision was made that Grand Rapids and Muskegon, to be right forward and out, and tell the people everything you could. We met with the medical societies, dental societies, and I mentioned before all the officials, as much as you could. The press was very cooperative with us, and the press put the story ahead of time, what we were in the schools for, what was going to happen, and why it was being done. They were very cooperative with us.

As I mentioned before, it so happened that as honest as we were in trying to let the people know, we had said that we would start fluoridating their water around October 1 or October 15, in that early range. Due to the delays, our examinations went on and the activities went on, and the people in Grand Rapids assumed that the water was being fluoridated. Well, of course, we knew and they had been advised and all that you couldn't taste it, it wouldn't make any difference. They wouldn't know, actually, when it was fluoridated. Well, this delay in equipment then became sort of interesting, because we couldn't make another announcement. By word of mouth, yes, it got around that it hadn't started, and if anybody called or anything, they were told, but there was no official announcement. They couldn't hold any inauguration of fluoride, which newspapers and so forth love to do for publicity, but which is a matter of informing the public, too, and has its advantages. So we kept delaying this, hoping, you might say, each week that this equipment would be received and installed and go into operation and would make a splurge of the thing.

This didn't actually get into operation until January 25, 1945, that the first fluoride was added to the water and they started in operation of adding fluoride to the water. Well, the press, of course, got various letters in of people who were getting backaches and headaches from the standpoint of those who wrote in and said that they were getting pregnant from the water, and others said the water had made them sterile and so forth. It was quite a conglomeration of letters, as there always is in these things, from the populous into the newspapers. A couple of newspapers, right in their announcement that the fluoride was going in the water, the day they announced that, they also ran columns showing some of the typical letters that they had received. They selected, of course, and were careful of which letters they put in. But to me, it turned out to be a very fortunate incident, because it cut down crank letters almost 100% and has held them down in Grand Rapids tremendously.

Knowing what has happened in many other cities since we put it in, and the number of crank letters that keep going, knowing what has happened in the past, starting some five years after this started. What happened with the anti-fluoridation and how they've used these scare things and run political campaigns on them and so forth, this was a most interesting experience to see how public opinion can be influenced to the good or could be done the same way, in those case, I think it was for the good. By uncontrolled events of just delay, and where showing something like this, it put the person, the crank

who may have wanted to continue his "crankishness," put him in the spot of realizing that when these letters were in, there wasn't fluoride or anything else in this water. It truly stopped any opposition which would have built up and could have stopped the study. We recognized this right to begin with and so did everybody else that knew the influence of public opinion.

The problem, on the other side of the fence, one of the things that really hurt us in this study from a scientific standpoint was again something that while we had been criticized by the anti-fluoridationists about it, is not easily understood. We recognized to begin with that if this started working in Grand Rapids, Muskegon people would know it, and they'd begin wanting it. It so happened that Muskegon, in spite of the difference in size, their high school rivalry, football teams, and so forth, there was a lot of rivalry between the communities from that standpoint. So after about five years of study, when even preliminary reports began getting around that this was even showing benefit in Grand Rapids ahead of when we thought it would show, the study was originally planned to probably take at least ten years to begin to show a preliminary result, and it was planned on a 15-year study basis. But after a little more than five years, it was beginning to be obvious to us that we were showing beneficial effects in Grand Rapids.

This also was occurring, we knew, although the results were not published, in the studies at Kingston and Newburgh in New York, a very comparable study to ours, and one that got started about six months or a year later than we did in Grand Rapids, and in Branford, Ontario, and in Evanston, Illinois. All these studies were on comparable setups and doing the same type of a study, with differences in the mechanics of the studies.

The principle of the thing was testing fluoridation of water supply in all these places. Of course, the movement then, in some areas, was to go right ahead, that the Public Health Service was dragging its feet, and at that time we were being criticized—I was criticized many a time in meetings and all—because we were not coming out and recommending as an official policy at all the fluoridation of water supply. Our argument was, "We should wait until we get good, sound, scientific evidence in the studies that were already under way before we put it in as a statewide procedure or a recommended procedure from the Public Health Service."

So the first part of this story shows a tremendous buildup in pressures for the Public Health Service to put out a proclamation to declare fluoridation safe, effective, and so forth. The anti-fluoridation group had not come into the picture to any extent. Yes, there were people then from a scientific standpoint that questioned it and followed, shall I say, our tactics, but much more vociferous than we did. There was the gradual buildup of the opposition from the Christian Science group in small bits here and there because of the possible assumption of medication, and the pure food-pure water groups that we have in this country, that they want God's water only and do not want manmade water. But there was a push at the time primarily coming from the group in Wisconsin, was that we were dragging our feet and that the Public Health Service should come out and recommend fluoridation for the nation as a whole.

This got a little bit touchy from a political standpoint. We wanted to hold off, but Muskegon officials, at least, began to know the results that were occurring in Grand Rapids. They began to get itchy feet and wanted to move to see that Muskegon had just as good of teeth in their kids as Grand Rapids. As I mentioned, we recognized this as being a potential hazard to a good scientific study where you have controls for the ten years, that is, non-fluoridated people for ten years and fluoridated people for ten years. This was discussed at length here at the Public Health Service, of people that had a set policy. It was obvious that from a moral and ethical standpoint. We couldn't say to Muskegon, "No, you can't do it," because this would not be morally correct. From the scientific and research standpoint, we were hoping that they didn't do it, but we certainly could not come out and say, "Don't do it just because we want to finish a research study." We could not hold to that philosophy and did not hold to that philosophy. We did talk to the Muskegon officials, and they did agree to our finishing out through the

spring period when we were examining in Muskegon, so that we could get our final examinations and our final bacteriological tests and so forth at the latest possible moment. But then they went ahead after that, with our blessing, too, at least with our official blessing. The studies then proceeded without any true hitches right throughout the first ten years, and then later we cut down the protocol of the study to less examinations during the last five years, up through the 15th year. In fact, we went through 17 years in some aspects of the study.

One of the interesting points, it doesn't very well show on the official record, I think it was in the testimony in 1951, possibly an appropriation testimony, where Dr. Scheele was testifying for the Service, and I believe at the time he was testifying for supplemental appropriations. And this I still claim may have been a trick, in his opening statement, he announced the real good benefits of water fluoridation in Grand Rapids and so forth. The discussion got along to the point of why isn't this being put in other communities and so forth, and actually, at the time, we had not published the results. They were talking on unpublished data that they knew we had in our offices here, of course, from the study, but we had not made a formal publication on any of the results of Grand Rapids, and we had not intended to for a couple of years. We were holding off because we wanted to have a little more scientific and more firm basis. But, okay.

The thing was out, and then political pressure really got pushing hard. We got one of those frantic calls to get a publication out. The publication did get out in a couple of weeks, and maybe there are some things that if we had had longer time, could have been better said in the preliminary publications, some of the things that sort of haunt us a little bit now in court battles and so forth. But be that as it may, that was the background of how that occurred.

I can say right here and now that at the time, I did not agree that we should do it, but that decision, of course, was not for me to make. We did publish. Then things started pushing nationwide. On the basis of that, that is, when the stand was taken by the Public Health Service. You must realize that the Public Health Service at the time was in the Federal Security Agency. And the Federal Security Agency was headed by Oscar Ewing. And it was also during this period, when the Murray Wagner Dingle Bill was one of those red flags on socialized medical care. And the unfortunate thing in our first publication, we used the title of "Fluoridation of Water for Mass Control of Dental Caries," that became mass medication, mass medication being socialized medicine, and that really kicked off the whole anti-fluoridation picture. Anybody who looks back sees it, can see that one come. We were innocent. We were "dumb scientists," you might say, who never thought of what the use of those terms could mean.

And that's when it was shown that Oscar Ewing was a lawyer and consultant to the Aluminum Company of America, ALCOA. And then the stories got out that this was being pushed for Aluminum Company of America and by the socialized medical group, and Aluminum Company of America was getting rid of excess fluoride that came from the production of aluminum. It so happens this is not true at all. Anybody that knows the production of aluminum, ALCOA was buying fluoride products to make aluminum. Granted, one of the problems they have in making aluminum is the fact that fluoride goes off in fumes, but that's not the fluoride you're using for treatment of water supplies. And they weren't selling sodium fluoride as a byproduct.

Then it later became an anti-Communist campaign and fluoride was put in to weaken the brains of the American public. It went through the full gamut and still had the full gamut down to the day of those accusations which are repeated and repeated and repeated today, as if they're new, and they're repeated in terms of scare pamphlets and all that, in political campaigns where people are trying to get a referendum through to get fluoride in their water. This is the tactics of the anti-fluoridation group. It'll die out, of course, in the course of time.

**Q:** Is there an organized anti-fluoridation group?

**DR. ARNOLD:** Oh, yes, several organized anti-fluoridation groups.

**Q:** Are they well organized? Do they have a group of people who run them, executive secretaries, that sort of thing?

**DR. ARNOLD:** Yes, but it depends on what you mean "organized." Some of them are groups. When you say an executive secretary, yes, there will be a group. There's one here in town. They're scattered throughout the country, small groups. They're not big groups at all. They're a definite minority group, very vociferous. But, you see, this became a hey-day for these small job printer groups, because this was the time when they were going broke, and the so-called pamphlet printer and small print shop owner and operator, during the war, remember, they had gone down. They had no business to do. This was a beautiful chance for him to start into business again, because he makes his money out of pamphlets and distribution of material of that sort. This is in back of it, in a lot of cases, they did this by organizing opposition groups. This would be where the money really went, but it never shows on the tickets in those cases.

*End of interview*