

Dr. Francis A. Arnold, Jr.  
Fourth Interview

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Interviewer: Dr. Wyndham D. Miles

DR. ARNOLD: I think, Dr. Miles, we'll start off with finishing up on the anti-fluoridation which we were speaking of last time I talked to you. The group has remained with us throughout the period of some 20 years now, and we still do have active anti-fluoridation groups. However, fluoridation of water supplies has proceeded in spite of these vociferous minorities opposing it.

I'll go back a little bit and talk somewhat a little more away from the fluoridation picture and into the development of the Institute itself.

Q: Could I ask you one question first?

DR. ARNOLD: Sure.

Q: Were there any attempts to fluoridate such things as soda water, which is consumed in large amounts, like Coca-Cola and Pepsi, or maybe even to fluoridate milk for the good of infants?

DR. ARNOLD: There has been, yes, and different techniques. I don't recall going into fluoridation of Coca-Cola. There has been the proposal to fluoridate milk, and, of course, at the present time there are fluoride tablets on the market. Then you had the development—not to get a commercial in here—but of Crest toothpaste, fluoridation toothpaste, and you know where that is today, what Proctor and Gamble did on Crest stannous fluoride toothpastes. There are several fluoridated toothpastes on the market. As I say, I don't recall at the present of any proposals to fluoridate such things as soft drinks and so forth.

Q: I suppose that they're prepared from some water supply which is already fluoridated, and they have it in them.

DR. ARNOLD: They would have it in it. Your Coca-Cola here in Washington has one part per million of fluoride in it, because such things as Coca-Cola are shipped to various local areas in concentrated form, and they're bottled there. They use the water. They're bottled and carbonated at that plant, like here in Washington. They use regular fluoridated water. This was one of the problems that arose very early in the fluoridation game. The fluoridation of baby foods, Rochester, New York, was one of the places that I can think of, but this question was raised to the Food and Drug.

There are limits, as you know, on the amount of fluoride permissible in foodstuffs. The Food and Drug, as I think I mentioned at some earlier time, did not take any stand against water fluoridation, and they have not taken a stand against the use of fluoridation waters for the preparation of such things as baby foods, the principal one, because they are a concentrated type of food. When you cook spinach to make a baby food out of it, you are, in effect, boiling it down. And you do increase the fluoride content of such a foodstuff, but at the same time, when you use them, you dilute them back up again, so you're back where you were. So it's not a problem. It was a problem and an argument that anti-fluoridationists would use, all these dangers that were occurring. But none of them have occurred and I'm sure practically all of those things had been investigated and looked into as to what it really means in terms of a person's total fluoride intake.

Fluoridation in milk, they tried to do this, but the main factor is that a water supply and a total daily intake in water is somewhat self-limiting. A person only drinks within certain limits. Some people drink more water than others. I don't mean to say that, but there are limits, and the limits of the studies in these fluoride areas

represent the limits of the fluoride concentrations that people would get. Take, for example, Aurora, Illinois, or out in Colorado Springs in the early studies. You would have people who would drink a lot of that water, you'd have people who drink a little water. When it came to fluoridating milk, which can be done, I mean, there's no problem about it, but it's a problem of distribution. Where are you going to fluoridate milk? How are you going to control the distribution of it? Are you adding it on to an already existing fluoride? This is the real problem behind that, because you have areas in this country that do have natural fluoride waters that are at optimum levels, we'll say one to 1.5 parts per million, and you have some with more. Well, if you start adding this into that area, you would maybe get up to where you would start producing at least milder forms of mottled enamel or dental fluorosis. There's no way in our country, really, to control distribution of this sort. For all the milk we drink here in Washington, D.C., doesn't come from Washington, D.C., or just right in the local area; it comes from all over and gets into interstate commerce. So these are the factors that come into it.

We have run a study on using fluoride tablets in areas where they didn't have fluoride, to furnish kids a daily dose of fluoride in the form of tablets. I did it with my kids, and we ran a study here using professional people, primarily at NIH, but professional people outside of NIH, who we could count on for doing the job. So many people think if one tablet's good, two are better and three are better. Well, this isn't what we're doing here. It stems from vitamin tablets and things we have in this country, where One-a-Day vitamin tablets becomes three a day, to make sure, and things like that. Well, we're not in that type of a game here. So there are certain problems involved with it, and that's why we stuck to professional people. It was very successful. This was prior to fluoridation in this area. I started back in 1940, I think, '39 or '40, on my older boy, gave him fluoride on a daily dose basis. This can be done but the practicality of it is just too difficult.

Our next door neighbor, for example, he found it was too much trouble for her kid, but then she ran into one heck of a lot of caries and all, and she was weeping on my shoulder for why didn't I make her do this, because my children didn't have any caries. But that may just have been by chance, too. And they're doing that today. They're on the market, several types of fluoride tablets. As I say, the unfortunate part, again, is distribution and the average person doesn't know what the fluoride content of his water supply. You can ask anybody in Washington, and you couldn't find one person in 100, if you asked them how much fluoride was in their water. Many of them wouldn't know whether there was or wasn't any in it, and wouldn't have the least idea. This would be true of dentists and professional people, too. Most of the dentists probably recognize and know that the Washington area is fluoridated. The people living out here in Montgomery County, there are only parts of Montgomery County that are fluoridated, for example, and other parts aren't.

Q: I wasn't aware of that.

DR. ARNOLD: This is true. If your water supply is coming from the Washington Suburban Water Company or whatever it is, which handles a part of Montgomery County, part of Prince George's County, and so forth, if it comes from there, it's fluoridated. If it's not from there, it's not. I forget right now whether Rockville has fluoridated its water supply or not, but it hadn't up until several years ago, I think. Maybe it is fluoridated now. These are the problems that from a Public Health Service standpoint make water fluoridation so practical, but some of these other techniques which would work from a scientific standpoint, research standpoint, have been shown to work, are not practical from public health procedures. That's the same as you could boil your water and you wouldn't need it chlorinated, but we wouldn't control disease if we depended on everybody boiling their water. But I don't know, I think we can pretty well maybe drop fluoridation.

It might be interesting for you to know that I just got a letter in from Branford, Ontario, today, a chap that's director of the dental health program in Branford, which was one of the original ones, you will recall.

Newburgh, Branford, and Grand Rapids all started within a few months of each other in fluoridation. He's interested in getting a combined study now of the three cities, because this will be the twentieth year, studying 20 years of fluoridation, which has certain interesting research potentialities. In fact, on the basis of that letter,

I've got a meeting scheduled as to whether the Dental Institute wants to go in and do a combined study some way. Maybe when this transcript is used for anything, maybe that will have been done; I don't know. It's just in the talking stage right now.

Going back, getting off of fluoride and water fluoridation, I think there was another very important effect or result of that. I think the success of water fluoridation research done here at NIH and then with the Dental Institute was important. Going back to things that it meant for dental research other than the practicality of it, as I mentioned before, it did represent a result of early studies in research that ended up, and we can see a beneficial result. This isn't always true of research, as you know. Sometimes you can never so well identify the pattern to where it is truly a disease controlling principle. We've had it, as you know, on some of the antibiotics. We've had it in other areas. But to live through a lifetime of it, the person doesn't always get the chance to be in the beginning and see the end result of 20 years of effect.

But the other thing that it did, I think it gave a boost to dental research, for one thing, nationwide. It had a lot to do, I believe, with our getting to be an Institute. I'm talking politically now. Because by the time we became an Institute, fluoridation and the story of fluoride was pretty well known. It wasn't accepted as an adopted public health procedure at that time yet, but the research had been done and enough was known to know that the potentiality of it was working. I think for that reason, it was one of the things that made dental research look good and was at least at the talking point to get a Dental Research Institute, which occurred, as you know, at the time the Heart Institute was created and several of the institutes here, the Cancer Institute per se, the Mental Health Institute, became a part of NIH, and the Dental Institute was created. Then soon we had the Microbiology and the other institutes all coming along in a year or two.

The other thing, it gave a good talking and sales point to get budgets, as far as Congress was concerned. This was research that you could show was paying off, and it was dental research. I think it helped us in getting a budget for a broader research program. Of course, that is the thing that let us spread our total research efforts away from fluoride and into the various aspects of our program that we have now, where we have a group now of some almost 300, 280-odd people here at this Institute, and a budget of \$20 million a year. Hopefully, that will go up, too, but I hope we have other things than fluoride and some things just as good as fluoride. Through an interest on the Dental Institute and the establishment of it, that, in turn, then became a home for research workers, trained students of dental research. It gave them a home within which to operate. This, to me, is what made the Dental Institute itself one of the world's largest research institutions, if you want to look at it that way. It's by far the biggest group of scientifically trained personnel who are dedicating their scientific careers to studies of disease processes related to the oral cavity as a whole.

Q: Could you turn this around for a moment and look at it another way? Suppose the Public Health Service never tackled this fluoridation problem. Do you think the dental section that they have out here would ever have evolved into a Dental Institute?

DR. ARNOLD: Of course, you're asking an opinion.

Q: Sure. I'm doing this to look at it from a different angle.

DR. ARNOLD: As I said a while ago, I think that had a lot to do about making us an Institute, and it had a lot to do about shedding a light on dental research as a whole. It brought it into the limelight. If you think at the time, there was doggone little dental research going on in this nation as a whole. Most of that research was not as we speak of laboratory and basic; most of that research was research in better filling materials and ways of filling teeth and in cutting down pain, instrumentation type of research. Not to belittle that, but this was pretty well what constituted dental research even back in the 1940s. There was very little of such basic studies as enzymology and basic bacteriological studies and electron microscopy and crystallography, things of that character. I really think that, in my own opinion, the successful research that started back by McKeon, carried on by Dean and then McClure and myself and so forth, formed a nucleus upon which this developed. I

don't think it would have developed nearly so rapidly. As I say, it made a good sales talk and you could show people that dentists and people in dental research could produce something that was broad in character.

On the other hand, I will have to say that the anti-fluoridation people, I hate to give them credit for anything, but in a way, their opposing and their raising questions showed that dental research was broader than just working on teeth and so forth. When they raised the questions of "What does this do to the bones?" and when they raised questions of, "What does this do to other parts of the body?" it forced dental research to broaden and take on problems that were not at all considered the field of dentistry, really, and dental research. It brought a concept that our mouth is a part of our whole body, and therefore, disease and so forth that are found there also have their influence on the total body. From that standpoint, I say it was a very firm push to dental research that I would hope we would have gotten there someday, but I don't think we'd be as far if it hadn't been for fluoride and the studies on fluoride.

Q: I've gotten you off the track perhaps. What were you going to talk about, the formation or the background of the formation of the Institute?

DR. ARNOLD: I think I did go into the formation of the Institute to some extent several times ago. Fluoridation did allow us to expand, and now we have expanded into a broad program of research, not necessarily related to fluorides at all. We have a research program which will be covered a little bit in more detail by a couple of the other people here in the Institute that were related to other aspects of it.

Q: I have some questions I'd like to ask you.

DR. ARNOLD: Go right ahead.

Q: I understand at one time there was some talk of the Dental Institute taking over some additional wings or some additional space in the Clinical Center. A decision had to be made whether to go there in the Clinical Center or have a building of its own. Could you give me the background of that and the circumstances surrounding it?

DR. ARNOLD: Yes, I can give you the background.

Q: And the arguments for it and against it.

DR. ARNOLD: Well, that gets a little bit difficult, to give you arguments for and against.

Q: Just the significant pattern.

DR. ARNOLD: I know what developed, because I was here and served on committees related to the development of the Clinical Center itself back starting in '47 or '48.

First, after it had been decided to build the Clinical Center, then we got the legislation creating the Dental Institute just about this same time. In the legislation we got authority for planning money and for a building. The question first arose, "Should the Dental Institute use this money, construction authority, and go ahead and plan an extra few floors or wing and so forth on the clinical research building?" This was argued rather firmly in Congress. I can remember Dr. Topping testifying that he thought this would be good. There was the point that if you had the foundation there and the foundations were already under planning, and the Clinical Center was in the planning stage, you would, in a way, get more for your money. Your amount of money would go further in terms of the number of laboratory modules or what have you on that.

The American Dental Association preferred not to do that, and this is testimony in Congress. But there were a lot of behind-the-scenes on that, too. It's not all up and forward. But the American Dental Association, which is our strong political power congressional-wise, they wanted a separate building called National Institute of Dental Research. You can look at that in various ways, whether they wanted a monument to their association, because they were the ones that got us the Institute, and they were the ones who were going to get us our money, too.

Their question was whether if we got into the Clinical Center, would we be absorbed by expansion of Heart and Cancer and other things in the Clinical Center. To answer that question would be hard. The space in the Clinical Center today is at a premium, as you know, and all institutes are short of space in the Clinical Center. So that side of it, in terms of building, did come into the Clinical Center.

The second thing that came into it was, all right, if you build a dental building, do you put your clinical facilities in that building or in the Clinical Center? Well, that was more or less of a practical one, because in the Clinical Center, you had to have dental care available to the patients from all institutes. So the decision then was that we would not put clinical facilities in what is now this building. Even in the original planning of our building, we did not plan clinical, by that I mean chairs and so forth for treatment. None of that was planned in the building, and there isn't any of that here today. At the time we fought to get twice as much space in the Clinical Center as we ended up getting in terms of the dental clinic there, but we went along with the decision to put our clinical research and our clinical care, patient care, treatment service, you might say, in the Clinical Center into one setup.

The original plans, which we fought for and lost out on, was to have twice the size of the clinic we've got over there now. I'm sorry I lost that one, but you have to realize that was back when plans for the Clinical Center were also bigger than they finally ended up with. The Clinical Center, on its original planning, was even a considerably larger building than it is now. Under the larger building, we had twice the clinical facilities. Then it was agreed, and it was soon agreed that there was no need in having only the dental clinic itself in the Clinical Center, but some of your activities that are directly related to patient care. I mean, your research activities. So, we got a wing of laboratory modules under that argument or debate, plus the dental clinic itself.

There was another decision made back originally in the planning of the Clinical Center that has just now changed within this past year, has just been changed. When the Clinical Center was being constructed, this is mainly Trendley Dean's concept, not something I'm criticizing him for, we did not want to get into the responsibility of direct patient care, and only had a research responsibility. This was his concept of it at the time. So our original setup for the administration of the Clinical Center put the dental clinic service part under the Clinical Center, made it the same as the X-ray department and pharmacy department and a couple others. This differed from the concept throughout the Clinical Center where an institute had professional responsibility for the care of the patients there in that institute. This changed the concept a little different, but Dr. Dean did not want to get into a responsibility of straight dental care for Heart Institute patients, Cancer Institute patients, and so forth.

That was straightened out just about a year ago. We have taken over the entire dental department as administratively under the Dental Institute itself. But up until about a year ago, that part of it functioned administratively under Dr. Nassor's office in the Clinical Center setup, and was paid for under the contributions of the various institutes to the operation of the Clinical Center itself. Now that will be budgeted going into next year. This year we have transferred from the Clinical Center some X-thousands of dollars to furnish dental care to the rest of the institute patients or to the other institute patients. Next year we will have it in our budget, so this is a change that occurred there.

Q: You told me that Topping was in favor of having the Dental Institute over in the Clinical Center in the ADA. But they are people outside of the Dental Institute. How did you people within the Institute feel about

his? What were the "for"s in favor of working in the Clinical Center or having a separate building?

DR. ARNOLD: Well, you didn't have many people that were involved in this. I was and Dean was, a couple of us, McClure. We didn't have enough that really had had experience. It was discussed to a great extent within our institute.

Q: I'm just probing around here.

DR. ARNOLD: I know you're probing, and it's a hard question to answer, to remember, to recall. On the whole, philosophically thinking, we, too, were worried as to whether our small group would get absorbed in the end by the growth of other institutes which had the abilities to get more budgets and so forth. I mean, the emotional side of it, after all, we can't compare to the potentiality of Heart Disease and Cancer when you're down at Congress talking to the people who are of that age. They're not worried about their teeth decaying and these things. So facing the practical side of it, we worried about that.

On the other hand, we saw the other practical side of getting a lot bigger building in terms of more space. So our wishes were somewhat in the middle, in the gray. It was just hard to really make up your mind which way you'd fight. Naturally, we couldn't fight NIH. I mean, the decision there was that they were going to try to see if this money could be gotten to build on to the Clinical Center, so openly we did not. We couldn't. We were a part of NIH, and if this decision was to testify this way, then, of course, we supported that decision. Behind the scenes, I don't think we did. I'm pretty sure, if I can recall myself, I was more in favor of the ADA'S position and working with them. But that was not opening, and I was not in a position to be doing much about it either. We did argue very definitely with Dyer and Topping. I can say today I didn't agree wholeheartedly with Topping's concept there, but it was one of those things that you were debating philosophy against practicality, and there was no question you could get more building, and we could get it.

It just so happened that decision may have been the thing that took us ten years to finally get the building. See, if we'd gone ahead with the Clinical Center construction, that would have been out and on bid and so forth before the Korean War. We did our planning here, and then we ran into the Korean War or Conflict, whatever it is, and then the Federal Government stopped appropriations for construction, and we were caught in that. We had an authority, but we had no money, and we couldn't build.

So we waited until 1959, I think it was, before we were in a position to go back and get enough political pressure to get the building that we've got today. That building we've got today cost twice as much money. So that's hard to say. We've got a nice building today and we've got our building, and it's already too small for us.

*End of interview*