

Dr. Francis A. Arnold, Jr.
Fifth Interview

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Interviewer: Dr. Wyndham D. Miles

DR. ARNOLD: I think one of the things we might go into a little bit, Dr. Miles, that I haven't talked of to any extent before has been the development of the grants, or extramural, programs of the Dental Institute. As I recall, we worked more the development of the Institute in terms of an intramural sense and as an entity here on the campus at NIH. I think an important development that came to the Dental Institute, as well as to NIH, but really, in a way, I feel more important to the Institute and to dental research, more important, shall I say, than it was to some of the other categorical institutes here at NIH, was the development of our extramural programs, our grants programs. This development, of course, started with the law establishing the Institute, but such a program never got into full swing until after the Korean War or in the early Fifties, and like other programs at NIH, made a big advancement in the 1956, '57, '58 era moneywise.

Prior to the establishment of the Institute, throughout the nation there was very little dental research activity in your dental schools and other institutions. Part of this stemmed from the fact of the unattractiveness of dentistry as an entity for research. Part of it was a misunderstanding on the part of the public and the profession itself as to the value of research. Dental research, along this period, was thought of in the realms of technical research and not in the philosophies and realm of biologic research, which NIH really represented.

The establishment of the Institute itself gave a tremendous impetus to thinking along this line, an impetus that was recognized in Congress, an impetus to the dental profession, to extend its biologic research activities. By the dental profession, I mean primarily its representative, the American Dental Association, to do more in the biological fields. They had been active in supporting some research in the dental materials field, and this activity was down at the Bureau of Standards. They started a small activity with us after we became an institute and got some funds available to support biologic research here at NIH on a comparable basis to what they were supporting materials or technical research at the Bureau of Standards.

The other advance made was the impetus of just the establishment of an institute, a Dental Institute, a research institute in dentistry, I think not only encouraged dental educators, that is, administrators of dental educational institutions, to recognize the value of research in their own institution.

It did give them a small pocket of money on which to look forward to obtaining grant funds. And with that small amount did encourage them to do more in terms of political activity or administrative activity at their own educational institution. To get more funds for dental research, try to get some money to set aside a couple of projects supported by the institutions themselves, and, of course, gave the impetus to testify before Congress for the need of more funds for supporting dental research.

When one realizes that at the time we became an institute and had our first grant program that far less than half of the dental schools in this country, as teaching entities, had no more than two people who were even labeled as research workers in the biological sciences. The whole philosophy of an institute and broadening dental research caught on with the dental educators and with university educators and started the move which, to me, today is just as important as the fact that we had a good, beautiful research building here in Bethesda. We also have a program whereby we have expanded tremendously. It's actually much more than tenfold, expanded from a program moneywise \$221,000 to a program today of some \$15 million, \$16 million. That only represents the funds available for grants through this institute, so there is a comparable movement from private foundations, although it's slow. You can see the evidence of the increased effort put in by the Federal Government of encouraging non-federal or private funds. And you can also see where the dental schools today in all cases have some basic biologic research being supported, part of which is being supported through our grants and part of which they have been able to get some local or private foundation

money, either through their budget at their university or through private foundations.

To me that is a tremendous advance in general education. That was a result of the development of the Institute, and is a development that's partially due to the activities of the Institute itself. By that I mean the staff of the Institute that took on the responsibility of going out and encouraging such a movement. When you got from, as I said, far less than having one, to where there's none of them that don't have at least one today. And many of them have programs that are up approaching \$1 million, I recognize these are not large programs compared to the more emotional and probably more important disease categories as Heart and Cancer and Neurological Diseases and so forth.

Q: Where did the force come from that caused this huge jump in the amount of money available for grants from roughly \$200,000 up to \$15 million? What caused the Congress to increase this amount to such a great degree?

DR. ARNOLD: The major force, other than the philosophical force, as I mentioned, the establishment of a center, a national center of Dental Research, which has its psychological effect on Congress and on the nation as a whole. It also gave the American Dental Association, which is our only lobbying force with Congress outside of government, a target upon which to build. By that, I mean they could testify to the need of funds and the need of these programs, and they could testify to it in such a way that they weren't testifying for themselves as a profession; they were testifying for something that here they had an institute which had the administrative potentiality and abilities to carry on, the same as other institutes. I say that because they were the ones, as I've mentioned before, the force behind creating this Institute. This is one of the reasons why they did want to create it. It is a similar force to the Heart Association testifying, getting funds for the Heart Institute and the American Cancer Society for the Cancer Institute and so forth.

Q: Back in the early days, did you have any difficulty giving the money away for grants? You mentioned about such a small number of researchers out in universities, and I'm wondering if there was enough researchers, let's say, to accept this money, enough proposals.

DR. ARNOLD: There was no problem involved in that whatsoever. I was talking to 221,000. Of course, today that would maybe support ten researchers on an annual basis. At that time, the average grant, in round figures, was running \$10,000 to \$12,000, so you're talking of supporting 20 to 25 researchers. There were capable research personnel in the dental schools at that time, men who were willing to spend part-time or even whole time on doing more research. It was a question of the schools did not have the availability of any funds. Dentistry had not produced a base of research workers compared to what was already present in medical schools, shall we say, when the Cancer Institute was inaugurated as an entity here at NIH and when the Heart Institute and so forth went into being. Of course, they went in with much larger budgets. This was a very small budget, and so the problem then was entirely a problem of deciding who's going to get a little bit of this \$221,000.

We had and have had no trouble along that line up until along the period of '57 and '58, when the problem was the same in the Dental Institute as it was in several of our institutes here at NIH, and one or two years since then. When Congress added on relatively large sums, so we had proportionately in an annual period rather large expansions to make in research. Those were the only years in which we, shall we say, did not have as many good, scientifically sound requests or applications as we could have funded. Those were the couple of years when we did not spend all the monies that were appropriated.

At present, and I'll get it down for the record, that's not true now and very definitely hasn't been for the last couple of years now. That is a problem of development of personnel and putting personnel to work as related to government's fiscal year of support. When you get relatively large jumps in appropriations in one year, and this has occurred to all the institutes here at NIH, you may not get all that monies put to work effectively during the period of time that monies are appropriated.

That was not at all in this picture back [then], because when we started as an institute and had \$221,000, there were many people in dental schools who were capable of doing research but had no real support. I mean, their support would be in terms of the dean being able to find \$400 or \$500 for them and things like that, which bought their test tubes and didn't even give them a technician. So the picture was entirely different.

The grant funds, at least for the better ones, gave them a chance to relieve their handiwork and let them put their brains to work by affording a technician, we'll say, in a laboratory. This is what a lot of the early funds were really aimed at when we had these smaller amounts, taking some known qualified people who had been doing research, shall we say, at horse and buggy pace, and had established reputations in terms of being knowledgeable in scientific research, but whose drastically limited budgets didn't allow them to really proceed. They did it on their own and at nights and times like that, and when they were teaching in the schools, which they'd have to do, they had no technician to carry on during the lecture hours and the various hours that are involved in a professor's time in a school.

That answers part of your question. It's hard to evaluate what force this really meant, because in such an occurrence, the thing spreads beyond just the individuals you're talking about, because this spreads down through your total school system then, and it spreads in terms of encouraging graduates to look at research. This has occurred. It gives a student, as he goes through dental school, something to look at other than just going out and practicing filling teeth; it encourages people to go into academic and research careers, or at least look at them as a potential for their professional career.

Q: Was there established when the grants were started, a Council comparable to the other council?

DR. ARNOLD: Yes. We had established a council. That had its values, too. There was the routine study section established, which, again, was a mechanism by which the spread of the importance of doing dental research, it was the advertising mechanism, you might say, that NIH and NIDR itself could use. It was the encouragement side of expanding dental research on a national scale. Can you think of anything else?

Q: No, I can't think of anything else along the line of the grants.

DR. ARNOLD: I don't recall that I had anything special that I wanted to finish.

Q: Have you ever talked about the problem of staffing, or have you had any problems in staffing the Institute as the years have gone by?

DR. ARNOLD: In terms of staffing the Institute, our major problem, to begin with, of course, was a natural problem here at NIH, that was the problem of space. When we were very short in space, we took the administrative attitude of trying to staff on a high ratio of professional to technical staff. We took the attitude and this is back in the early days when we were scattered in a couple of buildings here at NIH and when we did not have much laboratory space. We definitely, looking back today, from an efficiency standpoint, we hired a professional staff even though space did not allow us to put them to full degree of work. The establishment of our new building, in giving us more adequate space, has permitted us to expand the technical support of professional people.

We have not had, here at NIH, a problem of recruitment of highly qualified professional staff. This is due, in part, to two different things. We were the central source and the major area for a person who was truly interested in dental research to be working, because we were a larger corporation and group of scientists than at any one dental school or university. We, of course, were held down in staff in terms of lower budgets. Therefore, we had the opportunity to recruit topnotch staff in the nation, and we still have that ability.

As far as the intramural program is concerned, up until the last couple of years, we were not losing top-level staff from the Dental Institute as compared to some of the problems that I have heard discussed in other

institutes, that is, losing some of our top professional scientific staff to universities. There were two reasons behind that. One, we had far better facilities for them than they could find in dental schools per se, and in most dental research setups in universities as they were supported. In the past couple of years, that picture has changed to where, yes, we are definitely competing for top-level professional staff with dental schools and universities. This is a competition that is due both facility-wise and moneywise.

Q: That is, you can't pay them as much as some of the bigger universities?

DR. ARNOLD: At the present time, government salaries, while when I started earlier, particularly in dental schools, we were in a favorable recruitment position, even moneywise, to, shall we say, dental schools, because dental schools were not paying at the levels that medical schools were.

This has changed on the outside, part of which is due to the grants and support and so forth that NIH has given and NIDR has given. Now we are not in such a favorable position. We are still in a very favorable position in recruitment as far as facilities are concerned, and when I mean facilities, I'm thinking of both physical facilities, in terms of the Dental Institute itself, but I am also thinking of environmental facilities in terms of people working here in the Dental Institute and its relationship to the other institutes, all NIH.

I'm thinking of the facilities of NIH as an environment for research. This is something that has occurred here by our development within NIH that has not occurred, unfortunately, in a great number of our dental schools as a part of a university complex. Part of this has been deliberate in terms of staffing, because we have deliberately tried to staff and do programs here at the Dental Institute that were not being done through grants and were not quite so likely to be done, or not as easily done, in a dental school setup in a university. We deliberately staffed, going out and getting non-dental scientists. By that I mean straight Ph.D.'s in biochemistry and so forth. This I may have gotten into because back in fluoridation, and that philosophy carried through here, when Dean and I were the two dentists, but then when we got into fluoride, we went out to straight Ph.D.'s and got McClure and Zipkin and some of those. So that today, I think it's even less than half of our scientific professional staff are trained in dentistry at all.

Again, this is something we could do. This was our favorable position because dental schools could not afford this individual. If you look at it this way, to explain myself for the record and for you, a dental school could not hire. Well, we'll take an example. A Ph.D. or two Ph.D.'s or three in bacteriology, even though microbiology or bacteriology was one of the subjects that was taught in dental school, and so forth. They had to make this a part-time arrangement with the medical school, because they needed people, and they would have to hire people that, in addition to whatever they taught in bacteriology or microbiology, could also be available as a clinical instructor or teacher. In other words, they got dual use out of him. Well, you couldn't get dual use out of a person with a straight Ph.D. degree. This is another one of those favorable recruitment things that we had here that a dental school didn't have. This picture is changing. Thank God that it is. This is part of the pattern that was set up here that is also changing that pattern in the nation as a whole.

Q: Are there any specific problems or general problems that bear on you as the Institute director? I suppose you don't have any time for research yourself anymore, do you?

DR. ARNOLD: No. The answer is no. I carried on with the Grand Rapids study and was active in the Grand Rapids study, in terms of direct activity and time-consuming activity for research, up until the end of that study. 1956, I think, was the last. But since then, other than how you might say the reporting of research and the discussion of research and so forth, no direct research activities, no laboratory activities that I've become directly involved in. I dropped that. You can't do both things. Many people have found that out.

I think maybe to finish off another thing for the record that I don't think was in here, just to toss it in, going back to the fluoride, we'll keep the record up at least as far as we can go on the thing. I think it might be interesting to have on this record that at the present time, we are engaged in trying to get a joint study in

operation, studying the three major areas that started fluoridation just 20 years ago. This has been mentioned for the record. Newburgh, Branford, and Grand Rapids. We are on the books for later this month, we are having a get-together meeting with the people who were responsible, and still are responsible for those studies, to see what now would be important to go back and find out in these communities where it was definitely known when they put fluoride in and where you have records on people that were living there at the time, find out where they have been living, where you can get hospital records, the whole gamut of things.

This study is under contemplation, I'm sure, within the year. We'll get under way and this may truly wrap up the whole question, to answer some of the anti-fluoridationists, if you want to look at it that way. I can assure you that that part of the record won't be published, because we're not doing it just because some people that are unknowledgeable are squawking. There are various other things to learn when you make studies of that sort and have 20 years' experience with good records to begin with.

End of interview