

History
of the
U.S. Food and Drug Administration

Interviewee: David Link

Interviewer: Suzanne W. Junod, Ph.D.

Date: September 24, 2003

Place: Newton, MA



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GENERAL TOPIC OF INTERVIEW: History of the Food and Drug Administration

DATE: September 24, 2003

PLACE: Newton, MA

LENGTH:

INTERVIEWEE:

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FROM: 1970

TO: 1980

TITLE: Director, Bureau of Medical Devices

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Interview with David Link

September 24, 2003

TAPE 1, SIDE A

SWJ: Today is September 24th, 2003, and we're here in Newton, Massachusetts, at the Marriott, talking with David Link, the first head of the Bureau for Devices at the Food and Drug Administration. This interview is being conducted by Dr. Suzanne W. Junod for the Oral History Program of the FDA History Office.

DL: The Bureau of Medical Devices was established in 1974. The Medical Device Amendments came along in '76, and I was appointed the first Bureau Director in '74 and remained Bureau Director until I left FDA in 1980. Then, in the early '80s, the Bureau of Medical Devices and the Bureau of Radiological Health were combined to make the Center for Devices and Radiological Health, and at that time, John Villforth, who was then head of BRH, took over the head of the Center.

SWJ: Well, let's go back a little and talk a little about your educational experience and why you came to FDA and what made it attractive to you.

DL: All right. I was raised in Arlington, Massachusetts, went to high school there, and then went on to MIT and got a bachelor's degree in physics from MIT. While at MIT, I

was in the Air Force ROTC. They had a program then where the Air Force would send one on to graduate school for two years, and I took advantage of that and went to the University of Illinois for two years in the physics program and got a master's degree in nuclear physics, then spent another year taking courses, and then spent three years in Upstate New York doing research and development for the Air Force. After those three years, I got out of the Air Force, and joined the private sector, again, managing research projects, military research projects; and after a year of that, decided I didn't want to spend a career in engineering or science and went back and got an MBA from Harvard Business School.

Joined Hewlett-Packard when I graduated, out on the West Coast, spent a couple of years there, and then came back to an HP site in Waltham, Massachusetts, that made medical instruments. I was there until 1979, left Hewlett-Packard and spent a year with a management consulting firm, and at that time I was living in Lexington.

SWJ: 1969, you mean?

DL: Sixty-nine, correct.

And in those days, the head of the Bureau of Drugs was a doctor named Henry Simmons, and Henry had come from Lexington, and I had known him in Lexington, and he had told me that the then-Commissioner, Charlie Edwards, was looking for someone to head up the medical device effort at FDA, anticipating new legislation later on.

I went down and talked to Charlie, and he was a great salesman, and he said, he

convinced me I'd have a lot of fun down there. So I said, why not, and joined FDA in 1970, thinking I would stay about two years but remained there for ten years, from 1970 to 1980.

An Office of Medical Devices was created, I think, in 1972, and that office combined all of the medical device activities in one organizational entity called the Office, and that combined the small effort that was underway in the Bureau of Drugs with myself as the Office Director, Larry Pilot, who had come out to be an assistant to Charlie Edwards, and a secretary, so there were three of us who started. And the Office had a full complement of the various parts of a product entity in FDA. It had its compliance part. There was no pre-clearance at that time until the amendments came along in '76, so we didn't do any pre-clearance, but we took compliance action and things like that.

One of the major activities at that time was trying to police quack devices, because quack devices seemed to be what the Bureau of Drugs had been spending most of their time on when they handled devices prior to 1972. And one of the products I . . .

SWJ: Do you think it was an initial attempt to address the need for a devices law?

DL: Yes.

SWJ: Okay. Rather than any particular product that was . . .

DL: I think there had been . . . I don't think any one product activity brought that to a

head. Legislative proposals had been in the works for some time, so I think Charlie Edwards felt that the time had come, so he wanted to start something, not in the Bureau of Drugs.

And also, in 1970, Dr. -- who was the fellow we were talking about before from the Department, head of the National Heart and Lung Institute? Ted Cooper. In 1970, the Cooper Committee Report had been published.

SWJ: Now, tell me about the Cooper Committee Report. Those of us looking at it now find it's slim pickings to try to get a history out of it. Rumor has it he just, people think you just sat down and wrote it. It's only a few pages.

DL: No, no, no, no. It was a government committee, all government employees on the committee, and Ted was the chairman. And they spent a lot of time trying to identify devices, see what the state of affairs of devices were, and their charge was to lay out sort of a legislative blueprint, which they did. And the main part of that was a tiered system for regulation, Class I, II, and III. That was recommended in the Cooper Committee Report.

SWJ: Any idea where that came from?

DL: I think that came out of their own views. Thinking that devices presented different levels of risk; therefore, it made sense to regulate them differently. And that

survived into the amendments of 1976.

But I joined FDA in September of 1970. I think that was the same month that the Cooper Committee Report was published.

The Cooper Committee Report also recommended two other things: that an inventory of devices be created. By that, the committee meant identify the devices out in the marketplace. And the other recommendation was that they be classified into one of the three levels of control. So in the early '70s, we, mainly Larry Pilot and myself, we spent most of our time, and the few other people who were in the office that was created shortly thereafter, were out there identifying what products were in the marketplace and setting up a classification process. That process was developed by putting together two advisory committees, one in cardiovascular and one in orthopedic, and having the members of those, who were all professionals – doctors -- suggest a way in which they might look at devices and put them into one of the three categories. That, in fact, happened, and we classified most devices before the amendments came along by going through those two committees, even though they were specialized in cardiovascular and orthopedics only. I take that back. We classified them with those committees, but we set up other committees and other medical specialties using the scheme that those two committees generated. We filed that scheme to classify devices.

SWJ: You found them applicable to the rest of the field.

DL: So we had committees in, neuro committees, ob-gyn committees, general hospital

part of the committees, a whole list of them generally organized by specialty.

And then the amendments evolved in the early '70s and then came to fruition May 28, 1976, when the Medical Device Amendments were signed into law by President Ford.

And that was the basis for the activities thereafter, recognizing that the Bureau was created in '74, and then in '76 it really then, through the amendments, had the authority to do what the law stipulated FDA could do.

SWJ: Well, you started it as an Office.

DL: Yes.

SWJ: When it became a full-fledged bureau, did you get more people? Where did the money come from? Where did the -- was this all just carved out initially?

DL: Well, there was money, I think, in the appropriations for a medical device effort.

But by then the effort had reached the stature of having its own bureau-level status within FDA. And we started to write some of the regulations that the law authorized. We took the committees that had been set up and formally classified them. By that I mean with the authority of the new statute. So that process of classification was done in accordance with the regulations that we wrote on how to classify devices. And, of course, that classification regulation is still in the CFR [Code of Federal Regulations].

Actually, it took a number of years before classification was completed. I think

the last classification regulation probably came out in the late '80s, so it took more than ten years to fulfill that – to go through the process of having the committee look at all the devices that fell within their purview, recommending a classification, putting all of that into a proposal, and then going through the formal process of rulemaking, where comments were elicited, and then those were used to issue the final rule. So you'll see in the CFR, I don't know, probably something like 1,800 regulations that fall into three categories, but dealing with different classes of products or different categories, I should say, of products, all going from the I to the III level, the III being the most risky, those that are life-sustaining, life supporting, or implants; and then I being used for the more benign and simpler devices.

SWJ: Such as Band-Aids.

DL: You have to be careful with the word Band-Aid. I put that in a letter once, and somehow J&J [Johnson & Johnson] got a hold of it and they came back and said I didn't trademark the word.

SWJ: Yes, sorry. You're right. Bandage, adhesive bandage.

DL: Yes, adhesive bandage. That's right.

SWJ: I got in trouble over the word junk food similarly at some point.

DL: Did you?

SWJ: Yes. I mistakenly used that term.

DL: Well, it didn't take very long before it changed. Our lawyers reminded me that that was a trademarked name.

SWJ: Tell me, did you know Ted Cooper?

DL: Yes. I got to know him.

SWJ: Tell me a little about him.

DL: Well, he was a wonderful guy. I mean, personable, humorous, so he was very easy to work with. I've always said he was one of the best bureaucrats I've ever known, because I got to know him as head of the Cooper Committee. We had a number of conversations after he left NIH and became the Assistant Secretary for Health, and then he went on to, I believe, the private sector and became president of one of the big drug companies. And Mark Novitch became the vice-president.

SWJ: Upjohn.

DL: Upjohn, which then later got acquired. And then sometime later, Ted Cooper died of, I don't know if it was cancer or what.

But, as I say, he was a delight to work with.

SWJ: And had Mark Novitch worked with him? I wasn't aware of that.

DL: No, no. They just knew each other because Mark being a Deputy Commissioner and Ted being at HEW [Health, Education and Welfare] headquarters. So I suspect a lot of the stuff that went on at FDA, Ted got involved with through his position at HEW.

But also in 1976, we started to write the various regulations. In fact, we started to prepare some before the statute came along because it was, I wouldn't say it was clear, but it was apparent that the regulation would contain some new authority which would have to be converted into regulations. So we had some regulations out fairly shortly after the amendments of '76.

SWJ: And who was writing these regulations? Was it your group, or was it the Office of the Chief Counsel?

DL: No, no. We were writing the regulations, but, of course, they had to review everything, and like most lawyers, they felt the need to change things.

SWJ: And who were you working with? Peter Hutt at that point?

DL: Well, Peter was, yeah. He was the first general counsel I worked with.

When I first got there in '70, Billy Goodrich was still general counsel, but shortly thereafter, Peter took his place. Then Peter was there for, I don't know, two or three, four years, and he was replaced by Dick Merrill and then a succession of other general counsels. Nancy Buc was there while I was there, and Rich Cooper. And I don't think Tom Scarlett was general counsel when I was there.

I worked under four Commissioners: Charles Edwards, Mac Schmidt, Don Kennedy, and Jere Goyan, each of whom had his own particular personality and style.

SWJ: Well, we want you to tell us about all of them. But tell us about events first.

DL: Well, one of the interesting events that occurred even before the amendments of '76 would show that FDA still had authority to do things. It's interesting that they could inspect medical device companies, and they did. That was a '38 law, statutory provision. So they inspected this company in Florida called Cordis, C-o-r-d-i-s, and Cordis made pacemakers at the time, and FDA filed. The quality system they used to make pacemakers was inadequate. Therefore, they filed the charges of adulteration under the statutory provisions, and they tried to enjoin or shut down Cordis and Cordis rejected it and went to court down in Florida. And the outcome of the court battle was that the judge did not grant the injunction. The court appointed a special master, an expert in

quality systems, who looked at the Cordis quality system and concluded that they had made sufficient changes to bring it into a state of acceptability, and the court accepted that finding and did not grant the injunction. And I think both parties felt they'd won the court battle -- Cordis because they weren't shut down, and the FDA because they made them change the quality system.

And then later, when I left FDA, a few years after I left FDA, in 1986, I went down and joined Cordis, became their vice president for quality assurance, which was sort of an interesting turn of events.

But I just use that as an example to show that FDA had authority to find products misbranded or adulterated prior to '76.

Let's see. The amendments came along in '76 and we started to write the regulations, and they were written pretty much by our people, but, of course, with final approval and modifications by general counsel. And one of the first ones we wrote was the one 21 CFR, I think it's 807, and that's the one that requires registration, listing, and describes the 510k process, which was the process used generally for Class II devices.

Another provision of the statute, which never got energized, was the authority to set regulatory performance standards, and that was really the basis for Class II. Congress, in its infinite wisdom, said that for Class II devices or the . . . Congress didn't say this. This was part of the statute, so Congress did say it, but the statute defined Class II as a category of product which, if it complied with a regulatory performance standard, would be found acceptable, along with the Class I requirements. So we had the authority to set regulatory performance standards. I think the use of that process may have come from the

Consumer Product Safety Commission that had the same authority. It didn't take us long before we concluded that the requirement to set regulatory performance standards for over 1,000 devices which would probably end up in Class II was just overwhelming, and it might do more harm than good, because there's a problem with a regulatory performance standard. If it isn't set right, it can interfere with the development of new devices. So we concluded that we weren't going to use that, and we didn't. And to this day, I don't think there is -- well, there are some regulatory performance standards, but I don't think they were issued under the statutory version of the amendments.

Before the amendments came along, we set requirements for eyeglass lenses, to make them impact resistant, so that preceded the amendments of '76.

Now, there are other products that have requirements laid on them. For instance, tampons have requirements for absorbency so they can be labeled properly. That's in the CFR. And then, oh, I think there's one for . . .

SWJ: That came after toxic shock syndrome, didn't it?

DL: Yes.

SWJ: Were you there?

DL: Oh, yeah; oh, yeah. That's why I say I don't think there was any one event like the Dalkon Shield that was the basis for the amendments of '76. It may have contributed

to the view that something needed to be done. But I think the view for regulation evolved over the late '60s and maybe even the '50s as devices played a bigger role in health care and became more complicated, more sophisticated, and had characteristics which the user could not really judge for himself, or even some physicians and health professionals. For instance, an IVD, an in-vitro diagnostics product, would be very difficult for a pathologist who ran a clinical laboratory to evaluate it and decide whether it was good enough to use or not. So the complexity and sophistication of these things I think led more, and their use in medicine, led more to the passage of the amendments rather than any one particular situation like the Dalkon Shield.

SWJ: And what about the quack devices?

DL: Well, those were always open to FDA's authority, and action was taken against those long before the amendments came along. In fact, one of the products that was in the sights of three of the people who worked for the Bureau of Drugs before they joined the Office of Medical Devices was the Relaxacizer, no; it wasn't the Relaxacizer.

SWJ: The Relaxacizer was the one we issued a warning poster on.

DL: Yes. No, it wasn't the Relaxacizer. It was the Diapulse machine.

SWJ: When I first came to the agency, a man kept calling me and trying to convince me

to change the agency's policies on Diapulse. I'm just a historian, of course . . .

DL: Oh, yeah. I'll tell you, his name was probably either Jesse Ross, who was the president of Diapulse, or his assistant, whose name was Bernard Cyler [sp.].

DL: Anyway, the agency went after that product with a vengeance, and there were people in Drugs who pursued it, and they joined our office and they continued to pursue it. And at one time, they wouldn't permit the Diapulse company to conduct any animal trials on this thing to show its efficacy. But it was a classic case in pursuit of a quack device. Every time there was a new Commissioner or somebody new in the agency in a position of power, Diapulse would seek an audience with him, bring in a doctor who would extol the virtues of Diapulse. And, interesting enough, in the '80s, they succeeded in court and got back on the market.

But it was, well, I wouldn't say it's a regret, but while I was at the agency, I came across a photograph in one of the Southern newspapers, and it was a picture of an FDA inspector out in front of an office. And I'm not even sure where; that's not important. But on the ground was a Diapulse machine. It was a big machine. And it was on its side, and he had a sledgehammer. And he was going to smash the heck out of that thing. And the agency wanted to seize every Diapulse instrument out of a doctor's office. We said, "No, that's not worth our effort," because we'd shut them down. But these people were just incensed by that company and those people, and they just pursued that product with a vengeance, until they finally got it off the market.

And it was an interesting device. It was a diathermy machine, and the manufacturers, the company claimed that it had useful efficacy at very low settings. And the low settings were such that they didn't produce any perceptible heat. Now, diathermy heats deeper muscles with radiation, and, presumably, heating the muscles is therapeutic. But the settings, these low settings didn't produce that, but Diapulse claimed that those low settings were effective through the electromagnetic field and not the heat generated. And so our people said, "No, that's not the case. There's no evidence of that." So they wouldn't let them label it for use at those low settings, and that was the issue.

SWJ: Well, when the man called me, he kept arguing that we had approved another pulsed diathermy machine . . .

DL: Yes. There was another one called . . .

SWJ: . . . for use in broken bones to help, that was used for helping bones mend faster.

DL: There were other devices not unlike Diapulse which had been approved, and so they had some legitimate complaints about dissimilar treatment.

That was one of the quack devices that was pursued long before the amendments came along. And then there are many others that are recorded in history.

SWJ: Any personal favorites?

DL: No. That probably is my personal favorite because it was still being heavily driven when I was there in the early '70s.

SWJ: Well, what was your first crisis?

DL: Oh, crisis was probably the Dalkon Shield, but that's while we were still an Office. And we weren't convinced that the Dalkon Shield was any worse than some of the other IUD's at the time. The Safety Coil, Lippy's Loop, those were all IUD's without any additional material which presumably, like some that were approved in drugs, they had the copper, copper coiled around, and the . . .

SWJ: Copper-7.

DL: Yup. The elution of that copper presumably provided a contraceptive effect. But these other ones which were made out of plastic, like the Dalkon Shield, also had some similar results, but not as prevalent as the Dalkon Shield.

SWJ: And when did you first become aware that there was a particular problem with the Dalkon Shield?

DL: Well, I don't know whether it was brought to our attention or it came through

inspections or how it came to light.

SWJ: But certainly the way the company handled the questions became part of the problem.

DL: Yeah, A. H. Robins. That was their undoing. They went bankrupt after that or because of that.

SWJ: Yeah. Women's groups soon said about the Dalkon Shield that you could just look at it and it looked evil or bad.

DL: Well, it did, because it had sort of spikes on the side to hold it in the uterus. But that wasn't a problem. The problem, I think, was found to be the tail.

SWJ: The wicking.

DL: The wicking up this fiber that was used to remove it.

SWJ: And the others didn't have that.

DL: No, no. That was the only one that had that particular feature.
Any other? No, I can't think of any other events.

SWJ: Did you have to handle toxic shock syndrome?

DL: Well, that was one of the results of the Dalkon Shield. Toxic shock syndrome was tampons, yes. And lessons learned from that episode were reflected by changes in the regulations.

SWJ: CDC was also involved . . . Did they ever figure out what the problem with the Rely brand was?

DL: Well, not that I know of.

SWJ: Excess absorbency?

DL: Something like that, because, as I say, there is a regulation that deals with how that has to be labeled and how it has to be tested for absorbency.

SWJ: Were there any particular -- I gather the device field, more than other fields, had . . .
. Well, we think of New Jersey in connection with drug firms and whatever. And you were talking about Cordis being in Florida, and I know there was, in the Midwest is where . . .

DL: Well, they seem to be concentrated in at least three areas: Boston is one; the West Coast, Southern California; and then up around Minneapolis, because a lot of the pacer companies up there, Medtronic and I think other ones, which today are Guidant and maybe a few others up there, they had spun off from Medtronic.

Then there's another town where the orthopedic industry bloomed, and that's Warsaw, Indiana. I don't know who was first there, whether it was Zimmer or Homedica, but somebody started out there, and that first company spawned several others that are the prime movers now in orthopedic implants.

TAPE 1, SIDE B

DL: Intraocular lenses. That was a fun product.

They had just started to become popular in the mid-'70s when the amendments came along. And the doctors or the ophthalmologists who were convinced they served a useful purpose, they didn't want them to disappear, nor did the manufacturers. So they were willing to have special provisions written into the statute which were the only provisions which applied to a particular product, and had permitted that product to be continued to be used as long as it was used in a clinical-trial context. So all the manufacturers came in, and we said, "Okay, you've got to gather information on all the patients who get these IOL's." And it was profitable enough for them and the doctors that both parties agreed to do that.

So I think that IOL's may have been the product which resulted in the biggest

clinical trial in the history of man, because they were being used by the tens of thousands then, and every patient had to be part of that trial. And then all those trial results were bundled up by each manufacturer and submitted for subsequent approval.

SWJ: What were they looking for in the trial? These are for cataract patients, I presume.

DL: Yes. Oh, they were looking for safety, efficacy.

I know we came across some that, in their fabrication, had almost saw edges on the periphery, so they didn't do the eye any good. And there were problems with them. And it was controversial because the conservative ophthalmologist thought not enough was known about them to use them routinely in cataract surgery, whereas there were a number of very progressive, if you want to call them, ophthalmologists that were using them frequently because they were big moneymakers for them. And those ophthalmologists became known as the buckaneers, with emphasis on b-u-c-k, and they were scattered around the country, a number of them out on the West Coast and Florida, where lots of old people lived with lots of cataracts.

But I think to this day that IOL's are one of the current valuable advances in medical devices, as are total joints, because to either restore your sight or keep it from getting worse is pretty important, and being able to ambulate when you have pain in your hips or knees is pretty important.

I have a friend who is an inveterate skier. He loved to ski. And a couple of years ago he had a total hip put in, and he still skis. In fact, he's an instructor here in

Massachusetts.

SWJ: I've got numerous aunts who are happy with their new hips.

DL: Well, that's it. Even though they're not perfect, in most cases they work pretty well. And they have to be revised at some point in the future. And there have been some recent instances of some problems with certain brands. A company in Texas that was known as -- I can't think of it; I'll think of it -- they put out a total hip with a centered part to it that the tissue was supposed to grow into, but in manufacturing, that centered surface was not totally cleaned out of oil that was used in some of the manufacturing processes. So the tissue didn't grow into it, and they loosened up and it became painful and had to be taken out, probably within a year of being implanted. What was the name of that company? I can't think of it. But it's a Swiss company, which has, oh, it's been the source of acquisition contests between Zimmer and Smith & Nephew recently. Zimmer finally won out and will acquire them.

SWJ: Saltzer.

DL: Saltzer. Well, now it's called Centerpulse. That's the name of the company. I don't know why. Saltzer's a big Swiss company and they spun off or they sold the Saltzer implant portion of the company. And Zimmer was able to increase their share of the market substantially when they acquired Saltzer. Zimmer, Homedica, and Depuy.

That was independent until it was acquired by Johnson & Johnson a few years ago. So those are the three big players in orthopedic implants. Actually, Smith & Nephew is a major player. Smith & Nephew, Zimmer, and that's not even Homedica because Homedica was owned by Lilly, and that was acquired by Stryker. So Stryker is now a big player in orthopedic implants, mostly hips and knees, but elbows kind of thing, shoulders, some ankles. But the big quantities are in hips and knees.

SWJ: Well, to get to my favorite topic, the heart valves.

DL: Oh, yes.

SWJ: Was the -- well, some of the research I'm doing right now is trying to document the early days of heart valves, when it really was a free-for-all out on the marketplace.

DL: Well, yeah. The first ones that came along were ball valves, and that was a plastic ball inside a metal cage, and that was just to open down and open-close.

SWJ: The Hufnagel valve.

DL: Among others.

SWJ: Among others, yes.

DL: Yeah. And there was a characteristic called ball variance, where lipids, I think, in the blood would attack this material and cause it to either disintegrate or fragment or lose its properties of integrity. So when that happened, the ball would not function properly and the valve wouldn't function properly.

Then there came other valves with materials, tilting disk valves, and Chiromatics was the supplier of those because they put on a surface on this disk that was very hard, wore very well, and was very, had low thromboembolic properties. Clots wouldn't form on the disk. So these came out of a number of different companies. Some had a couple of disks, others had one disk that would tilt.

And, of course, the other kind of valve is the tissue valve, which we used to refer to as pig valves because a lot of the tissue came out of pigs' valves. Those don't have the longevity of the mechanical valves. So for a young person, they'll tend to put a mechanical valve in because that will last longer than a tissue valve, which will tend to deteriorate over time. Both of them, however, I think, have a role in heart valve replacement.

Just about all the devices, we got involved one way or another. As soon as it became necessary to either get a pre-market notification, a 510k form, or a PMA [pre-market approval], then we were off and running, and those provisions were almost self-affecting when the amendments went into place. The PMA regulation wasn't put in final form until the late '80s, where the 510k provision, that was in, that came out early on. So we started to receive 510k submissions probably within a year of the amendments. Then

the PMA's came shortly thereafter.

Then there was the IDE [Investigational Device Exemptions] regulation, the equivalent of the IND [Investigational New Drug] but for devices. That got written and rewritten and finally came along.

Then there was the regulation that said how to classify devices, and then another regulation on how to set performance standards, which we never used.

What are the other regulations?

Well, there was a regulation on banning, which was a provision in the amendments of '76. You could ban a product. The only one we ever banned when I was there was artificial hair, hair implants, because they were really grizzly things. I don't know how they do it, whether they take certain kinds of fibers and loop them through the scalp or put a little anchor in and loop them through the anchor, but none of them worked very well, so we banned all of these artificial hair implants.

SWJ: Well, tell us your experience -- I think you were telling me a little bit earlier about the Shiley valve.

DL: Oh, the Shiley valve. Well . . .

SWJ: It has your name on the approval.

DL: Yes. About ten years after that was approved, which happened in 1979 while I

was still the Bureau Director, I got involved in some of the court cases as an expert witness. And one of the first documents that was provided me for review was the PMA application. And I looked at the end of it, and it was signed by me. I had approved it in April 1979. But that was a case where the plaintiffs' attorneys had discovered what they thought was a defective product and were going after it with a vengeance, as they do so often now, like breast implants. Certainly a lot of the drugs now have found themselves in that category, class action suits against a manufacturer for defective products.

But the issue in the Shiley heart valve was whether or not the defects were more than offset by another property, a lack of thromboembolytic features, and the company was able to convince the agency that those features were so important and so valuable that they offset the failure of the valve when one of the struts would break and let the disk loose. So there was an ongoing contest between the company and the agency for a number of years.

SWJ: Well, obviously, you didn't know about the strut failure when it was first approved.

DL: Oh, no. Well, there had been one strut failure in the clinical trials, so we knew about it. But I think that was offered as a random event, not a structural defect. And to this day, the agency claims that the welding in that valve was the cause of the defect, and they'll use that event as one of the reasons why processes have to be validated in manufacturing. They'll use welding and they'll use the Shiley. In fact, it wasn't a bad

weld that caused the failure, but it was a particular mode of action of the disk that when it closed, it closed in a way that hadn't been anticipated and loaded the struts such that the strut would ultimately break because of the excess loading on it. But anyway, so that was finally withdrawn from the marketplace.

SWJ: But what I've understood, too, from doctors was that it was a welded valve, which was unusual because all the other valves up to that point had been carved out of a single piece.

DL: Well, no, I don't think so. I think the original ball valves, the cage for that was essentially wires that were attached to the sewing ring somehow. But I don't know whether they were welded or not. But in the Shiley valve, they went to machining it from a single piece, including the struts. The struts prior to that time had been formed and inserted into that ring and welded in. But that was one of the heart valves that unfortunately, although it worked well, it had that fatal defect.

So in vitro diagnostics – that's what I'm talking about. Before the medical device amendments, some in vitro diagnostics were regulated as drugs, then they switched over to being regulated as devices (they are in the definition of devices). In vitro diagnostics are the things that you use to diagnose things – the things that you use to collect, prepare, and examine specimens taken from the human body. They are used principally in clinical laboratories, and they range from the broad, fully automated tests, such as blood and urine testing machines, to “hand made,” “home brew” tests made by a specific lab to test for a

specific thing (e.g., a genetic test for a rare disease. In a Proposed Rule, 44 Fed Reg 52950 (Sept. 11, 1979), FDA talks about how some were regulated as drugs, some as devices, and some as biologics (hematology devices, e.g., blood grouping sera, hepatitis B antigen, reagent red blood cells, among others). I think that the story of the early in vitro diagnostics (maybe for spina bifida, or Tay Sachs, or something else) were part of a controversy. I am also interested in how/why they went from being drugs to devices – who wanted the switch, why?

Even though they're just a subclass of medical devices, they seem to get treated differently because they are used in a different location. In a clinical laboratory, even though you just supply information to the professional, there is almost always an intermediary between the patient and the information. That's the professional. And the professional will use that information in determining what a cure or treatment should be. Now, the exception to that are the OTC [over-the-counter] IVD's [In Vitro Diagnostics].

SWJ: But was there any discussion over IVD's being under, say, biologics as opposed to devices?

DL: Not at that time.

SJ: That's later.

DL: That's later. That came along later having to do with those IVD's that are used in

blood processing and blood screening. Since Biologics laid claim to all of the blood stuff, they laid claim to those as well. So if you're going to submit an AIDS test or a hepatitis test used in blood screening, they'll have to go through Biologics. And one of the problems is that I think has occurred over the years is that Biologics failed to realize that they should manage those as devices, which they are, using device law. They tend to get swept up in their own views of things, which include, I think, trying to understand everything about a product before they approved it, and that slowed down a lot. So whereas, for the 510k now, the agency has to do something within ninety days of receipt, Biologics has -- and this is my own view -- has sort of failed to realize that obligation, and in many instances the review time goes well beyond ninety days before you hear from them. And I don't know whether that's a symptom of the way they handle biologics drugs as well, since I guess the lack of acceptability of how they handle biologics drugs may have been one reason why drugs were moved from biologics -- some of the biologics drugs were moved from Biologics to CDER [Center for Drug Evaluation and Research], the Drug Center.

SWJ: Yes, just recently.

DL: Just recently.

SWJ: That's right.

DL: So those people who have had to deal with biologics have had a tough time.

But, again, back to IVD's. IVD's are unique from the standpoint, there is a regulation that deals with the labeling of IVD's, whereas few other devices had any labeling regulations devoted to those devices.

And then there is a guideline, or I should say guidance document, that deals with the manufacture of IVD's, which IVD manufacturers should be familiar with and generally follow in the manufacturing of IVD's, even though the regular quality system or regulation applies to IVD's as it does to all other medical devices.

SWJ: Do you remember dealing with any in particular?

DL: IVD's?

SWJ: Yes.

DL: Well, let me see.

SWJ: So the first ones I think were in the '60s.

DL: Oh, yeah. Well, they were around, there's no question about it.

One I remember in particular was a serological test for -- what was it? -- for a sexually transmitted disease. I don't know which one it was. And . . .

SWJ: Syphilis or gonorrhea.

DL: One of those, yeah. And that came before an advisory committee, and the advisory committee said, "Oh, no, we can't approve this because it doesn't work as well as a culture test."

DL: So I looked at that and said, "Wait a minute now. I mean, it's so much easier to do a blood test than a culture test that even though it may not work quite as well, it still has value." So I overruled the advisory committee, and I think we approved it. But that, to me, was an example of where they didn't look at the whole scope of is it valuable to have a test out there, because you'd bring people in, you'd discover it, and you're able to treat it more easily than if the only thing available was a culture test. So that was one of the first things.

DL: And then there was another one, a test to determine spina bifida, AFP, alpha feta protein. And when that came up before the agency, every interested party came out of the woodwork -- the pediatricians, the obstetricians, the right-to-life people, the laboratories who did it as a service -- and they all had their own views on whether it should be approved or not.

DL: If you ever see Mark [Novitch?], ask him about AFP, because he got involved with that.

DL: And I think it didn't make it through then, but it did sometime thereafter. And still, any JVD test that claims to determine Down syndrome is controversial because of

the abortion implications.

I don't know. I would like to think, and I don't think that the agency lets itself get involved in that subject too much.

SWJ: RU-46 was approved.

DL: Oh, yes, that's right.

SWJ: But we did take it out of the display case when the present administration took over. We don't invite trouble.

DL: No. But I also think that FDA isn't subject to excessive political interference. I can't remember any time when any congressman or senator tried to intervene on behalf of a constituent, only maybe to get the agency to do something instead of sit on it and do nothing. But to try and push approval or rejection or anything like that, I don't remember that ever happening. Now, certainly the Commissioner is a political appointee, but as far as somebody calling up and saying I have company A, B, C and they're giving you a tough time, clear that or approve it or get it out there, I don't think that happens very often.

Now, not that some companies don't think about that. They clearly do because they're so frustrated with the agency doing nothing, they feel they have to do something. So they'll go to their congressman or senator and try and get some help.

SWJ: I think we have the Office of the Ombudsman now.

DL: Yes. I know of Les Weinstein. And, interestingly enough, he put out a . . . Well, let's see. It was before his first annual report. Somewhere along the line, he put out a report which showed that, of the issues brought before him, the majority of them went in favor of the sponsor rather than the agency, which tells me something.

SWJ: That's interesting.

You said you reported to and worked with four Commissioners. We're always interested in getting working perspectives on the Commissioners.

DL: Well, Charlie was the first one.

I must say that none of them micromanaged the program, which to me was satisfying. We kept them informed of what we were doing, and if they accepted that, fine, let's go ahead and do it. And, of course, that would include general counsel, which gets involved in most everything down there.

But Charlie Edwards, he was a good guy; and Mac Schmidt, he was a good guy. Don Kennedy, he was all right. I didn't cotton to him as well as I did to Edwards and Schmidt. And Goyan I didn't get to know that well.

But I can't think of any of them who took any great particular interest in any particular device.

SWJ: But they had other issues they were dealing with most of the time.

DL: Oh, yes. One of the things I remember about Mac was that Teddy Kennedy scheduled an oversight hearing. And I don't know what the subject was, but Mac went down all prepared to respond to questions, and it turned out that the hearing was a result of some complaints from people in the Bureau of Drugs, so Kennedy and his committee members just dumped all over Mac. And he spent the next year compiling a big, fat volume contesting all the claims that the committee made about the way drugs were being managed. So he took that personally and spent an awful lot of time responding, whereas I think that Charlie Edwards was politically savvy enough to realize that that's just part of the game. Even now, you take your lumps and you walk out of the committee hearing room and say, "Okay, glad that's over," go back and do what you want to do in the first place.

SWJ: Tell me about the two counsel that you worked with.

DL: Oh, well, let's see. When I got there -- what was his name, the one in the . . .

SWJ: William Goodrich?

DL: Yeah, Billy Goodrich. He was still there, but not for long. He was replaced

shortly thereafter by Peter Barton Hutt, and Peter had his own agenda. I think, I don't know whether unconsciously, Peter said to himself, "I'm going to put a mark on this agency in a couple of years," whereas it may have taken Billy Goodrich many years, and he did. And Peter was, in a smart, energetic guy. And one of the things I think he did well was to put a lot of procedures that the agency was doing that weren't defined or described anywhere in formal fashion. He put in administrative procedures in the front, a few regulations in the CFR, 21 CFR, administrative hearings and things like that, which didn't exist before. He was going to make so that the rules of the game were fairly clear and you'd know what they were, they're transparent.

Dick Merrill, he was a joy to work with. He was a real, when I say a real lawyer. I mean he served his clients well by trying to help them do things that they want to do if it were possible.

Nancy Buc I didn't know that well, and Rich Cooper I didn't know that well. I think those were ones who were general counsel when I was there.

And then some of the other Center directors like Les Crawford. He was a lot of fun, a joy to work with – not that we worked a whole lot together, because Vet Medicine didn't want any part of veterinary devices. They didn't really care about them.

And then Hank Meyers from Biologics. He used to say biologics is the only research-oriented part of the agency, since having come from NIH and being really developers of vaccines, they were driven by research. So I think he was probably right when he said that.

And then the Drug directors. Henry Simmons when I first got there, and then

Dick Moss, I think, after that.

And I was at one oversight hearing where Dick Moss was testifying, and I've forgotten who the committee chairman was. It wasn't Dingell, it wasn't Waxman, somebody else. But one of the committee members made a statement, and . . .

SWJ: Dick Crout.

DL: Dick Crout, Dick Crout. He was there. And a committee member said something, and Dick Crout corrected him. So the chairman of the committee took his gavel, and I thought he was going to break it. He pounded it so hard. He said, "Dr. Crout, don't ever let me hear you correct one of my committee members."

But it was interesting. Those oversight hearings were staged. I mean, here these guys are up here, you're down there. You don't know what the questions are going to be, so you have to answer on the fly, sort of. And they just made it clear who's the boss here, and you're some little bureaucratic underling and we're calling the shots, and don't you forget it.

SWJ: I think they still maintain that kind of decorum.

DL: Oh, yeah, sure they do. But Dingell and Waxman were high, wide, and handsome when I was there.

The other Bureau directors, Foods -- I've forgotten. I think -- I can't remember

his name, the head of that Bureau.

SWJ: Sanford Miller?

DL: Sandy Miller, yup. And we didn't have much to do with Foods. And Biologics, as I say, was Hank Meyer. And BRH [Bureau of Radiological Health] was John Villforth. I always thought that BRH . . .

I always felt that the Radiation Safety and Health Act was the salvation of the BRH because now they had something useful to do. And they spent a lot of money on laboratories and developing performance standards for radiation-producing devices. And I think when John acquired the Center, he realized that there was a lot more to do in Devices at BRH, so a lot of the people got diverted from BRH type of activities to Device type of activities. And being the Center Director, he was able to bring a lot of his own people in, like Walt Gundaker and put them in positions of importance in the Center, which is fine. It's all right.

But I'd go every once in a while to see John. I did anyway when he was head of the FDLI, and we reminisce about the old days.

But I think when he was Center Director, he -- I don't know whether he liked or didn't like the 510k and the PMA process or not, because they never had to do anything like that in BRH.

But then when [David] Kessler got in there, he had [Robert] Temple come over and look at the clinical trials that were done in Devices and dump all over them, and that

got a lot of M.D.'s over at the CDRH, like Bruce Burlington and ODE -- Susan Alpert. She went and joined C. R. Bard (now Medtronic).

TAPE 2, SIDE A - BLANK

TAPE 2, SIDE B

DL: [commercial free speech] . . . whatever appears on the end, that may well stimulate some landmark cases. Or what is said in consumer advertising, direct-to-consumer advertising. That's become a big issue.

The agency just recently claimed that some companies aren't giving enough emphasis to some of the side effects, as we were talking in the car.

SWJ: I think we're getting lots of complaints from consumers about direct-to-consumer ads. That they're pervasive, that they're absolutely pervasive.

DL: Well, you might as well complain about any advertising which you think is excessive.

SWJ: People are always interested in health and medical issues, though. So they're paying attention but find themselves irritated by the absolute sheer number of these ads.

DL: Is there any evidence that docs are coming down on one side or the other? I mean,

I've read both sides. Some docs think they're good because they alert people to conditions and they might seek treatment.

SWJ: OTC?

DL: And other doctors are against them because, I don't know, they may think that it suggests to patients things that they haven't talked about.

SWJ: I don't think the doctors are concerned about that as much as patients coming in requesting name-brand drugs . . .

Doctors would prefer to see some more head-to-head drug comparisons, and they don't know who . . . I mean, obviously, who's going to pay for that?

DL: And a lot of the health plans are wanting to put their money where their mouth is and do the studies. Maybe not. And then the payers, they tend to gravitate toward the generics because they cost less.

SWJ: The knee-jerk reactions tend to be in the extremes, whereas patient care and health care cost seem to be somewhere in the middle.

DL: Yeah.

SWJ: It's hard to get to that middle ground, I think.

DL: Whether any of it will shake out of a federal plan to pay for drugs, I don't know.

I get most of my news from the *Wall Street Journal*, and there was an article the other day on rationing, where hospitals now are asking themselves whether a patient should get a very expensive treatment, whether the benefit is there, and one of these drugs that they cite is Xigris, a drug for sepsis. Six thousand dollars a day. And the hospital will question whether they should give that because it's so expensive and they're already losing money. So how that'll shake down, I have no idea.

SWJ: Well, the first drug I remember being controversial with regard to cost was Prozac because it was a dollar a pill, and now we think that's inexpensive. I don't even think the generic version of Prozac is a dollar a pill. So it's hard to know where we got way off. I guess AIDS drugs were some of the first that were just astronomically expensive.

DL: And, of course, the question of whether or not developing countries should be able to make these things and ignore patent considerations.

SWJ: Do desperate times constitute desperate measures?

DL: Oh, yeah.

SWJ: Anyway. Well, this has been a wonderful discussion. I appreciate being able to get some of this early Device history on tape.

DL: Well, it was fascinating to be there in the early days, I can tell you.

SWJ: I was going to ask you, how many people did you have in the beginning?

DL: Well, we started out with three. All right? My first job was special assistant to the Commissioner, and then added Larry Pilot, and jointly we had a secretary, and we worked very closely with John Jennings. When the Office was formed, we moved over to the Chapman Avenue building, and there we probably had maybe twenty people. We added some Compliance people and a few others. And then, I don't know when we moved to Silver Spring, Georgia Avenue. I think it may have been shortly after the Bureau was formed in '74 and built up a pretty big staff over there. And I think when I left, we probably had, between full-time equivalents in the field and BMD, Bureau of Medical Device, people, probably 350.

SWJ: Went from three to 350 in a decade.

DL: That's right.

One of the things I remember when I was made the Bureau Director, people kept after me, "You've got to have a deputy." I didn't want a deputy. I said, "I don't think

you need a deputy.”

If you look at business, every manager doesn't have a deputy. But I was sort of persuaded to take one, so that was where Vic Zafra came on the scene, and he took over when I left, until John, I think, became manager of the Center.

Also, people said, “You've got to ask for more money,” and I said, “I don't want to ask for more money, because if we get more money, we'll probably do things we shouldn't do.” You know it's going to be spent.

And I often think of the example, we had a laboratory, a Bureau of Medical Devices laboratory, down in the South Agriculture Building, now Washington. And right beside that laboratory were some Ag offices, one of which was the Bureau of Rural Electrification [BRE]. I thought to myself, here's an outfit that was designed to supply power to rural areas, and you'd think that once . . . I swore to myself that they weren't going to be satisfied until every farmer had power, whether they wanted it or not. So that organization has continued to exist. Then they got into, I think, rural cooperatives. They found a way to justify their existence. But an example of a government program that, having served its purpose, should end, cut it off, but that never happens. It's easy to start something. It's a lot harder to stop it because you build up constituents who benefit from it. It's like agricultural subsidies.

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END OF INTERVIEW