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Human Radiation Studies: Remembering the Early Years

Oral History of Pathologist Sidney Marks, M.D.

Conducted October 11, 1995

Prepared for
the U.S. Department of Energy
Contract DE-AC06-76RLO 1830

Pacific Northwest National Laboratory
Operated for the U.S. Department of Energy
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Pacific Northwest National Laboratory
Richland, Washington 99352

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ORAL HISTORY OF PATHOLOGIST SIDNEY MARKS, M.D.

The interview was conducted on October 11, 1995, in Seattle, Washington, by Frank Hungate from Pacific Northwest National Laboratory.

Sidney Marks was selected for the oral history project because of his more than 44 years of practical experience in the fields of pathology and radiation. The oral history covers a portion of Dr. Marks' long career.

Short Biography

Dr. Marks was born in Chicago, Illinois, on June 28, 1918. He received his B.S. in 1938 and his M.D. in 1942 from the University of Illinois. In 1961 he received a M.S. from the University of Idaho in physics, based on night school study in the School of Nuclear Engineering, Richland, Washington. Dr. Marks received a Ph.D. in biostatistics from the University of California in 1970.

Professional Society Memberships

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American Statistical Association
Biometric Society
College of American Pathologists
Mathematical Association of America
Montogomery County Medical Society
Medical and Chirurgical Faculty of Maryland
Society for Epidemiologic Research
Society for Occupational and Environmental Health

Education and Employment

HUNGATE: Sid, would you please elaborate on your pre-Hanford background; perhaps identify areas which are relevant to going to Richland.

MARKS: My background prior to going to Richland was [spent] obtaining a residency in pathology at Michael Reese Hospital in Chicago; after which I worked at the VA [Veterans Administration] Hospital in Albuquerque, New Mexico, for about a year and a half. Then I was actually ill with tuberculosis for a period of one to two years. [After that] I went to Richland to serve as pathologist at Kadlec Hospital. I was [also] a part-time consultant to the biology lab and did the pathology for the biology group in the Hanford laboratories as it was constituted. I continued in those capacities until 1964 when I started the Ph.D. program at UCLA, and I continued to work 3 months of every year in Richland as pathologist at Kadlec Hospital. I had given up the research at that point. I continued that through 1968, and then I was gone from Richland until I obtained the Ph.D. in 1970. I was subsequently on the faculty of the University of Maryland, then on the staff of the AEC [Atomic Energy Commission]. I continued to do those things

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until, I believe, 1976 when I returned to Richland and served in the Life Sciences Center as assistant manager until 1986. Does that answer your question?

HUNGATE: Yes. So you were pretty busy with serving as a consultant for biology and doing your graduate work through the center for quite a period?

MARKS: Yes, but upon my return, I no longer worked in Kadlec Hospital at all, I didn't do any pathology then.

HUNGATE: You were strictly with Battelle at that time.

MARKS: With Battelle and in an administrative capacity with some participation in the epidemiology and biostatistics programs.

HUNGATE: So, at least in part your move west was dictated by health problems, to come to drier climates.

MARKS: No it wasn't. The TB was over with in 1950. I never had any reoccurrence of it.

HUNGATE: Well, great. I was not aware they were able to conquer it prior to that time.

MARKS: Subsequently they gave drugs that kind of wiped out the residual infection which prior to that would get reactivated from time to time.

HUNGATE: While you were interning at Edgewater [Hospital] and or during your subsequent residency at Michael Reese [Hospital], were you in any way aware of the testing going on at Stagg Field in the interest in the development of radioactivity and reactors?

MARKS: No, I think I had some glimmerings of the fact that there were mysterious things going on at the University of Chicago, but I had no idea what they were.

HUNGATE: When you were a medical student, was it common practice to use students as subjects in various research projects that the staff was doing?

MARKS: No, it wasn't. At least not in Illinois.

HUNGATE: When I was at Stanford they certainly were.

MARKS: Is that right?

HUNGATE: I was involved in two or three projects, and I think if I recall Bill Bair's interview, he mentioned that he also was involved in it. Can you describe some of the experiences while you were at Kadlec that were of special interest? You were president of the medical staff at one period.

MARKS: I was for a year. The only thing that happened at Kadlec was that I developed a Nuclear Medicine Program there, but it was just a conventional thing.

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HUNGATE: Now when was that, Sid?

MARKS: I think that must have been maybe 1954 or so. I don't remember.

HUNGATE: Because the development of nuclear medicine was something that progressed over a period of time, at least I was not aware of much nuclear medicine when I came to Hanford in 1952. So you must have been one of the early groups that developed such.

MARKS: I think I was perhaps because of the work going on in the biology lab. But it was strictly conventional nuclear medicine that we did. I don't remember the date that I started it.

HUNGATE: Did you interact with Dag Norwood and the HEHF [Hanford Environmental Health Foundation] group very much?

MARKS: Yes, I did.

HUNGATE: Were you involved in discussions with them of human exposures that they were planning? Some of which I think they did.

MARKS: I don't recall their doing any, but...

HUNGATE: I ran across some old reports of Dag's involvement with americium and plutonium and some of the things that they had very little data on in the early days. I just didn't know whether you would be involved in that or not?

MARKS: Well, at one point I was involved in an americium case where the individual had been exposed during the course of his work in the plant, and I participated in the follow-up of his case. That was not a deliberate experimental thing.

HUNGATE: Was that the case where the resin column blew up?

MARKS: I think so, yes. And then I was....

HUNGATE: Let's see. That happened after Dag was there. I think both Dr. Norwood and Dr. Fuqua had left HEHF at that time. I believe Breitenstein was the principal person in that treatment. When you were in Washington, you were working with, was it AEC, ERDA [Energy Research and Development Agency], or who was involved at that time? We went through a transition from AEC to ERDA to DOE [U.S. Department of Energy], I never could keep track of when one was the proper name or the other?

MARKS: I was working with AEC initially, and then I believe it became ERDA and at the time I left DOE, it was converting to DOE.

HUNGATE: What was the nature of the work that you did back in DC [Washington, D.C.]?

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MARKS: I worked in the biology/medical program, I've forgotten what it was called, Environment and Health Division, I think it was. I had contract responsibility for the statistics and epidemiology. So that was my role.

HUNGATE: Did you interact with any of the staff relevant to planned human exposures or anything like that in discussions or....

MARKS: I don't recall being part of any planning process with regard to that.

HUNGATE: Do you recall, was there a planning process on that?

MARKS: It was a local thing.

HUNGATE: When you say local, it was originated out in the field, or wherever and then the information gradually filtered back to headquarters. Do you know, did headquarters ever put a check on those plans?

MARKS: I don't recall that there was any check on those plans during the time that I worked there. DOE only became involved in it later, after I was back at Battelle, but I don't recall that we were involved in it at that time.

HUNGATE: Was there a formal review of that kind of thing that you were aware of back at headquarters?

MARKS: I don't recall any.

HUNGATE: This was in the period that Jim Liverman was head of that group, was it?

MARKS: It was, and I think there was someone before him, but I don't recall who it was....I think Bill Burr may have headed it up at one point, but I couldn't say.

HUNGATE: Yes, the sequence of people, I can't recall, either.

MARKS: Now, I did get involved in the human subjects issue on one thing. The plutonium studies of people who were considered to be terminal, which has been ongoing for some time and during the time I was there, they weren't providing the plutonium to people, but they were following up on it. This was an Inspector General's review of the program, which was conducted out in various laboratories and universities, I've forgotten. And I was appointed to go with the Inspector General's people out to the labs to get information and discuss it with people who were responsible at this time for maybe the follow-up. There was an Inspector General's report on this, and I've forgotten what the nature of it was. I think it was generally supportive of the program, but I can't say that for sure. That would be in the files somewhere.

HUNGATE: Now, when you went out in the field, and you met with the various researchers, who were like yourself, pathologists, or whatever at the different hospitals that were involved in the study...

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MARKS: I don't think there were many pathologists, but people in various capacities would be responsible at this point for the study.

HUNGATE: I knew of that study, but very little about it. Do you remember about where those labs were that were involved in that work?

MARKS: I think there was one in the San Francisco area, I believe that Argonne may have been involved. I just don't remember well. That information is available in the files I'm sure. But I really can't tell you. There were I would guess, about 5 or 6 organizations that were conducting it. I vaguely recall maybe Rochester was involved, but I'm not sure of that either.

HUNGATE: Now when you say Inspector General, was that out of the Department of Justice or was that DOE's Inspector.

MARKS: It was DOE's Inspector General.

HUNGATE: While I was at Reed College, I was aware and actually involved, probably about 1950 or '51, in some studies that were going on, and I know that there was another one going on in Portland involving the potential use of P-32 [phosphorus-32] to treat leukemia, and it's my impression that there were lots of these somewhat casual [studies] and very little control going on in the early days. Do you have that similar kind of impression?

MARKS: I would guess that is the case.

HUNGATE: And the hospital had authority to go off on its own and...

MARKS: Yes, I think there was relatively little regulation at that time. I don't know whether there were human subjects committees or not, but...

HUNGATE: Not that I am aware of. In the ones that I was involved, I was certainly not aware of any.

MARKS: I think that was the case.

HUNGATE: Again, in most cases, they were. Certainly the one I was involved with—terminal cases—and that was the last straw effort so that they hoped to gain information, but also to help the patient as a part of the process.

MARKS: Yes, I don't know how they would help the patient, but...

HUNGATE: In the one I was involved with, the patient was deemed to be well toward death and I got Christmas cards for a number of years. It was very strange.

MARKS: This was the case with the plutonium experiments, if you want to call them that, the studies. There were some individuals who were considered to be terminal who lived on for a period of time. I think this was attributed less to beneficial effects of the nuclide than to misperception of the seriousness of their illness.

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HUNGATE: That certainly can happen. I have always felt that medicine is in practically all cases an experimental process in itself.

MARKS: It is, absolutely.

HUNGATE: Since we are talking a little bit about perceptions, I guess I should mention one of the conscious exposures of people on a massive scale, not as massive as nuclear testing, but on a fairly massive scale, that we were all involved with, and that's the plan by the city of Richland to use its drinking water, taking it from the Columbia River downstream from the seven or eight reactors that were then dumping radioactivity into the river. Do you have any rememberence of that period when that decision was made, and attitudes toward the process.

MARKS: No, I don't.

HUNGATE: It has always made a strong impression on my mind, because here the people chose to do that rather than sinking wells or other procedures for getting water.

MARKS: Yes.

HUNGATE: It's my speculation that one of your most traumatic episodes was when you came back from Washington, D.C., to rejoin Battelle and then the Mancuso event was dumped into your lap, so to speak. Do you care to comment on that episode?

MARKS: Actually I had responsibility for the Mancuso event in Washington and it was an unpleasant experience, but I don't think I have any more comments to make on that.

HUNGATE: I recognize that it had tended to be because I saw in the records that you had to testify back at Congress for various things to defend having taken over the project.

MARKS: Yes, well, I was responsible initially for the contract management of it and what happened was that the advisory committee recommended that it not be pursued in this manner because there was a lack of faith in the way it was being done. Actually Mancuso was reluctant to publish anything, even in a temporary manner.

HUNGATE: I recall. A number of us had commented that there was nothing coming out.

MARKS: Right. As a consequence, the decision was made to terminate his contract, or to not renew it. It became an issue that he pursued vigorously and he got support from people who objected to the AEC's attitude toward any such thing. It became a political issue. The studies were conducted subsequently in a much healthier manner. Ethel Gilbert played a large role in it. She did excellent work in it.

HUNGATE: Again, that's documented and published and now available for people to use. Could you identify your perception of the attitudes toward the use of radiation and radionuclides for treating patients back in the period 1945-1970 as compared with now?

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MARKS: I think that in 1945 there was relatively little radiation treatment of people. My impression is that the treatment that was done was probably conducted in a responsible manner at that time. I think the treatment continued to be done in a responsible manner where you are dealing with radiation treatment. The methods developed over years, but I don't think there was anything faulty in the approach that [was] taken to treating with radioisotopes and radiation, x-ray radiation. I think that part of the medical activity is really pretty much free of blame. There obviously would be better [and] poorer projects that were undertaken, but this is inevitable in everything, but I think it was done in a wholesome manner. That's my impression.

HUNGATE: I guess I raised the question because at least it's my perception that we have changed, so now we are extremely critical of any uses of radiation that are not already documented and explored, whereas without a track record there were quite a lot of uses that had not been explored. If they hadn't been explored, we wouldn't know what we do today.

MARKS: There's probably an element of truth in that. No, I think that the early radiation treatments, I worked on some of them at UC Berkeley or UC San Francisco, I guess and at Washington University in St. Louis, I'm sure there are other places, but I didn't have any bad feelings at the time about how they were being conducted.

HUNGATE: Now, I guess my question (predicated on my own experience) was that there were quite a number that were done. I had no bad feelings because nobody really knew what to expect from them. So it was very exploratory. I think it is difficult for people nowadays to realize how little was known about radiation effects. But, again, I can't but remember when I went into a shoe store and stuck my foot into an x-ray machine to look at my foot in the shoe, and see if it fit. Pretty casual.

MARKS: That was, that was something that was given up, very wisely.

HUNGATE: How true.

MARKS: Actually, the motives for some of the human experimentation, or human studies, were quite decent, the thing that may have been faulty is that in the early stages they may not have discussed them adequately with the individuals in some cases. I am sure in other cases, it was done responsibly, but that would be the place where fault might lie and that's probably being investigated right now. The motives were pretty sensible.

HUNGATE: That's right, and again what's adequate then and what's adequate now are really quite different, the background is quite different.

MARKS: Much different.

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HUNGATE: You were a participant in the biostatistics relevant to quite a lot of the I-131 [iodine-131] studies that were done by Leo Bustad and the others there. How much can you comment on that?

MARKS: At that time, I wasn't in biostatistics. I was doing the pathology on those, and this was a sheep [study] and I was doing pathology on some of the rodents as well. The work was done very well, the I-131 was fed to sheep as I recall, and the results were very contributory to our knowledge of the effects of I-131 and so it was a worthwhile study.

HUNGATE: Let's continue, we just changed sides of the tape. We were talking about the animal thyroids and, do you identify, Sid, when the importance of the thyroid became very strongly established and the importance of I-131 to the thyroid, when that really became established as a factor in humans?

MARKS: I don't honestly remember when that happened.

HUNGATE: I've seen reference to the fact that it really didn't come to people's mind until the Windscale accident where a lot of iodine was released in England, and they identified milk as the primary pathway. Does that ring a bell?

MARKS: I would think that the use in testing the thyroid would have occurred before then, but I am not sure of that.

HUNGATE: I was thinking of it terms, not of the use of I-131 in evaluating thyroid function, but I was thinking of it in terms of damage to thyroid from casual releases like occurred at Hanford.

MARKS: That probably would be true.

HUNGATE: If that is the case, then Windscale, I don't remember when that was, but it certainly was well after Leo Bustad's and you folks' work on the I-131 and animals—had started. You mentioned a little bit about how one time you were approached to be involved in a tritium study, can you elaborate a little?

MARKS: The only thing I remember is that I was approached and I declined to participate because I had experienced so much x-ray exposure during the course of diagnosis and treatment of my multiple episodes of tuberculosis that I felt that I wouldn't want to incur any further radiation exposure that isn't absolutely necessary. The method of exposure, I don't remember, the method that they planned to use.

HUNGATE: Do you remember who approached you? Was it Harry Kornberg, or Roy Thompson, or I think Chet Delong was working with it at that time also.

MARKS: It might have been Harry Kornberg, but I really don't know.

HUNGATE: I think he might have been the most probable.

MARKS: Yes, I don't remember that well.

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HUNGATE: I don't have any other strong leads, do you think of anything that has come up in the course of our discussions that you might elaborate on or pursue other lines of interest?

MARKS: I did become involved in the human subjects issue and was chairman of the committee at Battelle and also worked on the DOE committee that dealt with this problem, Institutional Review Board (IRB), but this was at a time when it was all being conducted in a very formal and very proper manner, so it doesn't really bear on the issue of human experimentation.

HUNGATE: This was...When was that formulated at Battelle? Do you recall?

MARKS: I don't recall.

HUNGATE: Certainly after you returned from Washington.

MARKS: I don't know if it was before I returned or after.

HUNGATE: My recollection is that is was after, but I am not sure. You returned from Washington [D.C.] when?

MARKS: 1976.

HUNGATE: That was a period in which things tended to become quite a little more formalized. And increasingly since that time.

MARKS: Yes, though it is really not a problem at the present time, but any study that remotely dealt with human subjects was brought up to the committee. On a national plane, the laboratories that reported to DOE were required to have proper committees and follow directives that were issued, and were agreed upon by those groups.

HUNGATE: Were those directives handed down from Headquarters or were they something that was local and then approved at headquarters, or a combination thereof.

MARKS: I think they were more guidelines and the guidelines were developed by a committee and then approved by DOE and passed on to the laboratories and the specific implementation was left to the individual laboratories or universities.

HUNGATE: If they had a contract though DOE. And I presume that's very much the same kind of thing that was set up for the animal studies that they had guidelines similar. Yes, I am very well aware with your committee, because my Blood Irradiator Program came up to your committee.

MARKS: I hope we acted responsibly.

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HUNGATE: I am sure you did. It's unfortunate that it never got completed, but that's one of those things. Well, I can't think of anything else that we haven't covered. If you don't have something [to add], then I think we can close off then. I very much appreciate your taking the time to participate in this.

MARKS: I thank you for doing it in such an excellent manner.

HUNGATE: Once we got the tape recorder working, we did better.

HUNGATE: As an addendum to our discussion, were you in any way involved in the animals associated with the testing down in Utah, the sheep that were suspected of being or claimed to have been damaged by fallout?

MARKS: I had occasion to look at the tissue slides on specimens obtained from those sheep and did whatever description was appropriate and that was the extent of my involvement in the Utah sheep.

HUNGATE: These were sheep that Leo [Bustad] brought tissues from that he had autopsied in Utah.

MARKS: I don't know who got them, but whoever got them sent them to our laboratory, and I don't know if we were the only ones who did it.

HUNGATE: Probably several labs. Were you ever called on to testify in litigation?

MARKS: No, never.

HUNGATE: Was it your perception that there was radiation damage to the sheep, or do you recall?

MARKS: My best recollection is that there wasn't, but I'm not certain of that. It was some time ago.

HUNGATE: If there was it was marginal.

MARKS: Yes, and it was written up, I'm sure, and published in a paper.

HUNGATE: It is so interesting because so much of the material that is now being examined actually was published, like for instance, Paulsen's, studies of the testes damage. Were you involved in that study?

MARKS: I think I may have seen the slides on it. I may have but I am not certain on it. I was aware that it was going on and I may have seen some of the tissue slides, but I just don't recall.

HUNGATE: Sid, do you recall, was there ever any discussion involving the inappropriateness of that kind of exposure?

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MARKS: My best recollection is that is was not considered inappropriate; that it was considered something that where the prisoners offered consent and the question of using prisoners was not addressed in any discussion at that time. At the time it was carried out, I don't think it was challenged. I don't know if the Human Subjects Committee functioned at that time. Though it would have been over in the Seattle area [at the University of Washington]. So from our standpoint, it was just an interesting study and we were not part of the process of setting it up or of passing judgment on it.

HUNGATE: That reaction is very similar to my own, in that I know our staff in biology talked about it, knew of it, were not a party to it, but felt it was an interesting and a desirable study to undertake. Well, I think that wraps up what other stray pieces we left hanging.

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