



ORAL HISTORY PROJECT

**Lula O.
Lubchenco, MD**

**Interviewed by
Russell A. Nelson, MD**

June 25, 1997
Denver, Colorado

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Preface	i
About the Interviewer	ii
Interview of Lula O. Lubchenco, MD	1
Index of Interview	57

PREFACE

Oral history has its roots in the sharing of stories which has occurred throughout the centuries. It is a primary source of historical data, gathering information from living individuals via recorded interviews. Outstanding pediatricians and other leaders in child health care are being interviewed as part of the Oral History Project at the Pediatric History Center of the American Academy of Pediatrics. Under the direction of the Historical Archives Advisory Committee, its purpose is to record and preserve the recollections of those who have made important contributions to the advancement of the health care of children through the collection of spoken memories and personal narrations.

This volume is the written record of one oral history interview. The reader is reminded that this is a verbatim transcript of spoken rather than written prose. It is intended to supplement other available sources of information about the individuals, organizations, institutions, and events that are discussed. The use of face-to-face interviews provides a unique opportunity to capture a firsthand, eyewitness account of events in an interactive session. Its importance lies less in the recitation of facts, names, and dates than in the interpretation of these by the speaker.

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ABOUT THE INTERVIEWERS

Russell A. (Jiggs) Nelson

Dr. Russell “Jiggs” Nelson was born in Wichita, Kansas on November 17, 1918 and spent nearly all of his life in Wichita. He attended the Wichita public schools and graduated from Wichita East High School in 1936. His undergraduate education was at The University of Wichita, from which he received his bachelors degree in 1941 with a major in history. Three years later he graduated from the University of Kansas School of Medicine. His pediatric internship was at St. Raphael Hospital in New Haven, CT and he took one year of pediatric residency each at Mercy Hospital in Kansas City, MO and at Children’s Hospital, Denver, CO. From 1953 to 1955, he served in the medical corps of the U.S. Air Force at the rank of Captain at Castle Air Force Base in Merced, CA.

His professional life began with general pediatric practice in Wichita starting in 1947, with interruptions for additional pediatric residency and military service. In 1968, recognizing the importance of the emerging specialty of Neonatology, he opened a three-bed premature nursery at Wesley Medical Center and in 1972 he opened the first Neonatal Intensive Care Unit in the state of Kansas at Wesley Medical Center. He gradually moved his clinical practice from general pediatrics to neonatology and in 1981 he became full time Director of the Neonatal Unit, a position he held until 1988. He continued his clinical work and teaching in neonatology until shortly before his death.

Jiggs Nelson developed a neonatal transport service in Wichita in 1975, a service that has grown into a broader pediatric and maternal air transport service known as LifeWATCH. He was also instrumental in bringing the Head Start program to Wichita in the 1960’s.

He was an avid reader and maintained his interest in history from his undergraduate days, focusing on medical history, and specifically on the history of newborn care and on early incubators. He was one of the earliest members of the American Academy of Pediatrics to receive training in oral history methodology and he conducted the oral history interviews of Drs. Joseph Butterfield and Lula Lubchenco in Denver.

Jiggs Nelson was the recipient of many awards, including being the first recipient of the Wesley Medical Research Institute’s Quality of Life Award. He was named Citizen of the Year by the National Association of Social Workers in 1982, in recognition of his devotion to the provision of services for infants and mothers. He designated a portion of his estate for the establishment of the Russell “Jiggs” Nelson Endowed Scholarship for the Liberal Arts and Sciences at Wichita State University.

Jiggs is fondly remembered by his colleagues and students as a warm and caring teacher who dedicated himself to the promotion of excellence in newborn care and to the best in pediatric education. Many of his colleagues recall his distinctive appearance often in the hospital and at social occasions dressed in safari jacket, bow tie, Khaki Bermuda shorts, argyle socks and loafers. He was often described as being eccentric, but always interesting. He was noted for his vast knowledge of subjects outside of medicine. He also maintained a dedication to bird hunting until very near the end of his life.

Dr. Nelson died of prostate cancer on September 12, 2002 at the age of 83.

Interview of Lula O. Lubchenco, MD, FAAP

DR. NELSON: We are now in Lula Lubchenco's comfortable living area. It's the 25th of June at approximately 9:30 in the morning, and we're starting to talk a little bit about her life. Getting back to what you were talking about, your mother was a family doctor in South Carolina. What did she do there?

DR. LUBCHENCO: She did just general practice. She had an office in her home, where she had all these great big bottles of medicines and stuff that she dispensed. But she also was out on the road doing house calls an awful lot of the time.

DR. NELSON: Did she marry your father when she was a doctor?

DR. LUBCHENCO: Well, that really is kind of interesting, because he came over twice. The first time was to study cotton cultivation. At that time my mother said that the family doctor in town had really been somebody that she had admired, and she wondered how he did everything. But she had no idea that women could go into medicine. My father had a sister that was already a doctor, and he had a niece that was in medical school in Russia. He told her how they [female physicians] were very well accepted in Russia. So that gave her the idea that maybe she could. She was teaching school at the time. She had gotten a teacher's certificate I guess. So following his visit, she applied to medical school. Of course, South Carolina wouldn't touch her. She was a woman, and they just didn't admit women—period. So she tried North Carolina. They accepted her. She was the first woman that they had ever accepted. I guess the next year they accepted still another woman, and my mother and this woman were very close friends. So when she was about to graduate...

DR. NELSON: About when was she was admitted to North Carolina?

DR. LUBCHENCO: Well, she graduated in 1912. I remember that. That was called the Medical College of North Carolina [North Carolina Medical College, originally part of Davidson College]. Since then it has combined with something else [later became part of the Medical College of Virginia], but it was in Charlotte. When she was about to graduate my father came back, and that's when they were married and then went to Russia. This was over a lot of objection on the part of many family members. You know, they thought...

[Phone rings – recording interruption]

DR. LUBCHENCO: Well, then anyway, that's how she got to medical school. When they married and moved to Russia, that was when there was a lot of

concern about her going off into, you know, the end of the world at that time, 1912.

DR. NELSON: Dr. Zhivago almost, huh. [laughs]

DR. LUBCHENCO: Yes. [laughs] When they got settled, Mom practiced in Russia. She was a school physician in Russia. When the war broke out, or when [Aleksandr Fyodorovich] Kerensky [head of the Russian provisional government in 1917] was overthrown, they decided to come back. It was a pretty harrowing experience. Sometime I should let you read my mother's remembrance of all of this.

DR. NELSON: When she came back, where did she go?

DR. LUBCHENCO: Well, they stopped briefly in Colorado, but they really wanted to go back to South Carolina. That's when they bought the farm [in South Carolina]. He [Lubchenco's father] managed the farm.

DR. NELSON: Then she got licensed in Colorado, when she came back?

DR. LUBCHENCO: I think she did.

[Phone rings – recording interruption]

DR. LUBCHENCO: He ran the farm and Mom did general practice. That went on until 1930 or 1931. That's when it really was a depression in South Carolina. Mom had an uncle who was in practice in Colorado, and he asked her to come practice with him. That's when we moved to Colorado. That was my senior year in high school, then, out in Haxtun, Colorado.

DR. NELSON: Haxtun?

DR. LUBCHENCO: Then my father used his knowledge in chemistry, which had been his major in school, and set up a clinical lab in the hospital there in Haxtun. So then he went into...

DR. NELSON: Is that Haxtun?

DR. LUBCHENCO: Haxtun, yes.

DR. NELSON: He set up a clinical lab there. That was a new thing for them out there!

DR. LUBCHENCO: Yes, they didn't have anything like that before. I think it was fairly simple sorts of things that he did, but he was able to do that. He got very interested in bacteriology. In fact, he was particularly interested in

fungus diseases of the skin. He was identifying them microscopically. Well, anyway, Mom did general practice. Although she tended, when practicing with her husband—who was a pretty good general surgeon—to do the anesthesia. I don't know whether she had extra training in anesthesia, but she ended up doing more anesthesia and OB [obstetrics] and he did the surgery. They both did a lot of general practice.

DR. NELSON: Delivering anesthesia?

DR. LUBCHENCO: Yes, anesthesia and obstetrics.

DR. NELSON: Where is Haxtun?

DR. LUBCHENCO: Do you know where Sterling [Colorado] is?

DR. NELSON: Yes.

DR. LUBCHENCO: It's farther east, about 20 miles.

DR. NELSON: East of Sterling.

DR. LUBCHENCO: Yes. It's getting close to the Nebraska border.

DR. NELSON: Well then, you were in high school there. How did you end up in Denver?

DR. LUBCHENCO: Well, after I graduated—again, these were Depression years—the question was whether I was going to go to college. I was quite happy to go back and take some courses. I hadn't taken typing, which I wish I had now. But I got a scholarship to DU [Denver University]. I had an aunt who lived within walking distance of DU, so I could stay there, and with the scholarship I could manage. Things were really pretty tough at that time.

DR. NELSON: That would be what period?

DR. LUBCHENCO: That would be 1932.

DR. NELSON: They were *very* tough in 1932. I'm old enough to remember that.

DR. LUBCHENCO: Yes, they were real tough, you're right.

DR. NELSON: I was working in a bakery at that time. I still know how to bake, but I can't stand doughnuts or I can't stand cupcakes. Those and drop cookies were my main baking skills, which, in a German bakery [meant] I was at

the low end of the totem pole! These were American items that the Germans really didn't believe in...

DR. LUBCHENCO: That they didn't really like [them]. [laughs]

DR. NELSON: They had their own fried things, but not those. So when did you, graduate from DU?

DR. LUBCHENCO: Well, I had this combined thing that we could do at that time. I spent 3 years at DU, and then my first year in medical school counted as electives. So I got my degree in 1936, but I actually went to medical school the year before that.

DR. NELSON: Three plus your first year at the University of Colorado.

DR. LUBCHENCO: Yes. I wanted to go to medical school ever since high school. I think I got interested when my brothers and my cousins were interested. I would hear them you know, talking about this and that. Of course it never entered my mind...

DR. NELSON: Cousins? You had so many other members of the family who were doctors! You just assumed that was where you were headed.

DR. LUBCHENCO: A lot of it was just that. It never dawned on me that women couldn't go to medical school. So that was no big deal! I liked math and I liked science, though I never was one of these straight A students. I always had, seemed to have some other...

DR. NELSON: I had two sisters like that [excellent students]. They thought I was the village idiot. [laughs]

DR. LUBCHENCO: [laughs] No, I really had a little trouble getting into medical school because I didn't have algebra. They let me take physics without algebra, as long as I would take it by extension or something. So I got through physics, but it was on the basis of arithmetic. [laughs]

DR. NELSON: Boy, that would have been agonizing!

DR. LUBCHENCO: It was. I hadn't finished that course in algebra, which I was taking [by extension], because I found it terribly boring and I couldn't understand it. Algebra by extension is not really a great way to do that. But I finally made it.

DR. NELSON: So then you came out of med school when?

DR. LUBCHENCO: In 1939.

DR. NELSON: 1939. What did you decide to do in 1939?

DR. LUBCHENCO: Well, in 1939 I took a rotating internship at Colorado General, as it was called then [now University of Colorado Hospital]. It was during that year that I was trying to decide whether I liked obstetrics or pediatrics or pathology. Pathology, of all things! I don't know exactly why, maybe it was because during medical school part of my job was being an assistant in pathology.

DR. NELSON: We call them dieners in German, or we call them [famulas] in Latin. For the people who work as assistants, preparing specimens and those kinds of things.

DR. LUBCHENCO: Oh, ok. Well actually I did a lot of reviewing of slides. This was not until I was a junior.

DR. NELSON: Histology.

DR. LUBCHENCO: Yes, histology, a lot of it. Do you remember Enid [K.] Rutledge?

DR. NELSON: Yes.

DR. LUBCHENCO: She was the one who I worked for.

DR. NELSON: I see.

DR. LUBCHENCO: She was quite a character. So I think that's why I was interested in pathology as a possibility. I loved OB [obstetrics] except, you know, we had a terribly demanding OB service in medical school. We were on 2 nights and off 1. You know, by the time you're on 2 nights in a row...and we had a really big home delivery service.

DR. NELSON: Oh, a *home* delivery service?

DR. LUBCHENCO: Yes, as well as an in-hospital service. I always thought I was strong, but I thought, "I don't have the physical ability to do this." That's really, I think, the only reason I didn't go into OB, although I liked it.

DR. NELSON: Then how did you get interested in pediatrics? Did you have any models, in medical school itself, where you said, "That's the person I want to be like?" One of your teachers?

DR. LUBCHENCO: Yes, the Child Research Council [of Denver] had a big influence on my life. I got to know some of the people there and I admired Al

[Alfred H.] Washburn [MD], the head of that. I kept thinking of institutional medicine as something I'd like, and he taught pediatrics. There were several other people who taught in the medical school there. We didn't get to know the physicians very well except as teachers, although I will never forget some of [Edgar W.] Barber's lectures. He was so dynamic and he was just wonderful. But we didn't really get to know them. But we got to know the chief residents, and you sort of model after that.

DR. NELSON: Well, then, what...

DR. LUBCHENCO: In the second year I went to Washburn and asked, even though he didn't know me very well, if he would advise me about going into pediatrics. He gave me 2 or 3 hospitals that he thought had good residency training. He asked if weather or location in the country made a difference. I said no, I just would like to get some good pediatric training. One of the places he suggested was Strong Memorial [Hospital] in Rochester, New York. I got in there, and so my second year was in Rochester.

DR. NELSON: Then what happened?

DR. LUBCHENCO: Well, in the meantime, I got married to a medical resident. Joe [Carl J. Josephson] was a chief resident in medicine. We had gone together a couple of years, and we were married just 2 or 3 months before I was going to Rochester. It never, of course, occurred to me *not* to go to Rochester. I don't think it occurred to him, either. If I had accepted that position, that was that. You know? So he stayed home and I went to Rochester. [laughs] You were saying that there were some disadvantages [to] being a woman in medicine, but I haven't found that true except for that one time. Rochester was dead set against married couples. They had [as a question] on their application, "Are you married?" And the next one, "Do you intend to be married during [training]."

DR. NELSON: I went through that at New Haven. In fact, you didn't stay at home.

DR. LUBCHENCO: Is that right? You had to live in the hospital?

DR. NELSON: You worked every other night. You were on call on the nights you were off.

DR. LUBCHENCO: Well, when I was an intern, I lived right next to the ward. That was home. [laughs]

DR. NELSON: How long did you stay at Rochester?

DR. LUBCHENCO: Just 1 year. By that time I thought, "I'm going to be where Joe is, no matter where he is." The only place in Denver that was approved for residency was Children's [Children's Hospital Colorado]. I still remember asking the dean if he would send my transcript to Children's, and I asked [Muggeridge?] if he would send a letter. [Muggeridge?] was one of these people we really admired too.

DR. NELSON: Was that Malcolm [Muggeridge]? No, Malcolm was the great English...

DR. LUBCHENCO: No, Ed Muggeridge [unable to verify name].

DR. NELSON: Malcolm Muggeridge was the head of the *London Times*.

DR. LUBCHENCO: You know all these things that I sort of missed somewhere! [laughs.]

DR. NELSON: Well I have a different background.

DR. LUBCHENCO: Coming back to when I wrote to [Samuel L.] Clausen. He was the head of pediatrics at that time. This application was pretty damning, in a way, because if you were married or intended to be married, you could almost write off that application. So I wrote Clausen and told him that [Joe and I] were being married and that I was planning to be there, and I hoped it didn't interfere with my application of service. He wrote back right away, and he said he didn't care whether I was married or not. That was not one of his concerns. But he said, "We're far enough along that we've already put your name in as Lubchenco. If you changed your name at this time it might offer a problem." That's why I...

DR. NELSON: Left it Lubchenco.

DR. LUBCHENCO: Yes. It was not that I was an activist or anything. It was either that or I might not have a job.

DR. NELSON: Well, later we still did that, with interns. It led to so many problems explaining the dang narcotic license, so we just...

DR. LUBCHENCO: Well, that was another thing.

DR. NELSON: You just leave your name and don't worry about it.

DR. LUBCHENCO: That was another big part of that. By this time I had [a] state license, and I had a narcotic license and all of this stuff. So that's why I really kept the name.

DR. NELSON: What was Denver like when you were out here?

DR. LUBCHENCO: You mean, when I went to DU?

DR. NELSON: No, when you came back here to enter advanced training. What was the children's hospital in Denver [now Children's Hospital Colorado] like when you came?

DR. LUBCHENCO: I don't think at that time it had gotten to changing as much. It was a pretty nice, comfortable, family kind of place.

DR. NELSON: Tammen Hall hadn't been built yet, had it?

DR. LUBCHENCO: Yes, it had. It was [built] within a year or so of that time.

DR. NELSON: Oh, I can't remember that gal's name who ran Tammen Hall, who ran the nursing school?

DR. LUBCHENCO: Oh, you mean, oh gosh, yes. Oca Cushman [RN] [first superintendent of Children's Hospital Colorado].

DR. NELSON: Oh, I remember her driving the car. You could just see her eyes; that was all you could see.

DR. LUBCHENCO: Yes, Oca Cushman. She was very good to me. Then I stayed on as chief resident, and by that time the war was in full swing, I think.

DR. NELSON: That became a very busy service during the war.

DR. LUBCHENCO: Yes, very.

DR. NELSON: Of course, Denver began growing again during the war.

DR. LUBCHENCO: That's right. When I first came to DU, I think it [Denver's population] was about 100,000. It was a nice town. They still had street cars. DU was called a street car college, because so many people lived at home and went to DU. But it was nice at Children's. I had a good time there. [Roy P.] Forbes was one of the main teachers and attendings. That's when you got to know the pediatricians in town and worked with them.

DR. NELSON: So we have to go back here just a little bit...

DR. LUBCHENCO: Ok.

DR. NELSON: ...to Washburn and his influence before you left here.

DR. LUBCHENCO: Yes. Yes.

DR. NELSON: Did you actually work with Washburn during that period of time?

DR. LUBCHENCO: No, I never did.

DR. NELSON: Just knew him as a good friend?

DR. LUBCHENCO: And he was a teacher. He gave a lot of our lectures.

DR. NELSON: Yes, I know. But he was still running his program when you came back?

DR. LUBCHENCO: Oh, yes.

DR. NELSON: [He was overseeing the] cohort at the Colorado children's [hospital]?

DR. LUBCHENCO: Yes.

DR. NELSON: I see, yes. When you were at Children's, when did you become chief resident? In what year did you finish your residency?

DR. LUBCHENCO: Let's see. I was in Rochester from 1942 to 1945. But I had a stint of private practice in that time.

DR. NELSON: Oh, I see.

DR. LUBCHENCO: I took over for Verploeg's office when he went to the war.

DR. NELSON: Oh, Ralph [H.] Verploeg [MD].

DR. LUBCHENCO: Ralph Verploeg. But that arrangement just didn't work out. I didn't know much about money, and I was grossly underpaid and grossly overworked. Finally, Joe just put his foot down. He said, "You know, this is ridiculous. You don't have even have a life of your own. You're working all this time [and] you're not making any money."

DR. NELSON: Somebody's making money, but not you.

DR. LUBCHENCO: Yes. We were living on pretty little salary at that time. I think Children's paid \$50 a month. [laughs] We had an apartment, and

Joe might have been an instructor by that time. Then he went into practice and things did pick up a little.

DR. NELSON: Well, after the private stint there, you went...

DR. LUBCHENCO: Yes, I just went back.

DR. NELSON: You went back to Children's?

DR. LUBCHENCO: Yes.

DR. NELSON: As...

DR. LUBCHENCO: I think it was still [as] chief resident.

DR. NELSON: Chief resident. Well then, when did you go to the University of Colorado to be in their department?

DR. LUBCHENCO: Well, at the end of [19]44, almost [19]45, our first child was born. I took off from Children's at that time. I must have resigned, because I didn't have anything to come back to! But when she was a few months old, I started working with Harold [D.] Palmer. That was 1945 then—she was born the end of '44. So [in] 1945 I was working half time. I think I had a fellowship paid by one of the drug companies, Mead Johnson probably. What I was doing there with Harold Palmer and his technician...you know, I can't seem to remember his name right now.

DR. NELSON: Danielson?

DR. LUBCHENCO: Yes. Yes. Wayne [H.] Danielson. We were working with Vitamin A, and I had gotten very interested in cystic fibrosis.

DR. NELSON: Oh, yes, I saw that in your dossier.

DR. LUBCHENCO: Oh did you? That's right, we did that.

DR. NELSON: Well anyway I still want it to go on tape.

DR. LUBCHENCO: Well, anyway, that was what I did the rest of [19]45. Then Joe had a fellowship in cardiology with Paul [Dudley] White in Boston. That was the calendar year 1946, so we moved to Boston for a year, with a 1-year old. I didn't have a job in Boston, but I went to their grand rounds every week at Children's Hospital [Boston] and spent the day. They had kind of a postgraduate day, and I did a lot of other things during that day, so I had 1 day a week. But I really was ready to come back home.

DR. NELSON: How long did his fellowship with Paul White last?

DR. LUBCHENCO: It was just 1 year.

DR. NELSON: One year. I remember him [Paul White] well, because there were 2 textbooks that I recall. One was Paul White and the other was [Samuel A.] Levine. I remember Paul White had a footnote in there about the new cardiac glycosides. All of a sudden I'm in residency, this guy comes in and says this is something brand new. I have almost a photographic memory, [so] I said, "No, that's not new. That was produced in France a number of years ago. In fact there's a French company in the United States [that] tried to get people to use them, [and] they wouldn't use them." Couldn't believe it. He wouldn't believe me. I went in, pulled that book down, went to the page and said, "Read it!" You'd have thought I had knifed him. He looked at me like I was some kind of guerrilla warfare guy. Anyway, I remember that so very well. I always liked Paul White's book...

DR. LUBCHENCO: Joe just admired him to no end. He was really good.

DR. NELSON: I'd read the book about his trip over the ocean with Cornelia Otis Skinner, who was an actress you know. He had met her at that time but he didn't marry her or anything like that. She wrote that book [Skinner, CO. *Our Hearts Were Young and Gay*, 1942] about that trip overseas. [Skinner developed measles while on a voyage to tour Europe; she met White on the ship and he helped her disguise the measles and escape quarantine.]

DR. LUBCHENCO: I think that's where he wrote a lot of his books [in Europe]. On the Isle of Capri or something like that, as I remember.

DR. NELSON: So, then, you returned to Denver in what?

DR. LUBCHENCO: 1947.

DR. NELSON: 1947 returned to Denver.

DR. LUBCHENCO: At that point I just thought [for] sure I'd go right back to Children's and keep on working on cystic fibrosis. I mean, that was what I was hoping to do. So I went over and talked to Harold Palmer. Now Harold Palmer turned out to be an awfully good friend of ours as well.

DR. NELSON: He was a true gentleman.

DR. LUBCHENCO: He was, and Children's, we said, he being a pathologist, was still the best pediatrician that was in Denver. Because he was excellent.

DR. NELSON: He knew children's diseases. He *really* knew them.

DR. LUBCHENCO: He sure did. So he was one that I admired and he was a very good friend as well as advisor.

DR. NELSON: Certainly he was one of your models.

DR. LUBCHENCO: Yes.

DR. NELSON: I had a hard time dragging this out of you.

DR. LUBCHENCO: We'll get to that in a little bit, but Harry [H.] Gordon was one, I think, who really made significant changes in my life. But anyway, I went to Harold Palmer and he said, no, they didn't have any place. But he said, "You know, there's now a new professor and he's trying to develop a department. Maybe he has something for you." So Harold Palmer personally took me over to meet Harry Gordon. I'm sure that had something to do with it.

PAUSE IN TAPE

DR. NELSON: Back a little bit about meeting Harry Gordon. Well, Harry wasn't here a terribly long time, but he made a big change in Denver.

DR. LUBCHENCO: Well, he was the first full-time professor. Up until that time, they [University of Colorado] had volunteer chairmen. I think the last couple of years before Harry Gordon came they had Bob [G. Robert] Fisher. [He] was half-time chairman. But until then that was not a paid position at all. But Harry Gordon came at the same year as [E.] Stewart Taylor, who was the first full-time head of obstetrics. [Conversation interrupted as dog barks.] You know, Laika is her name. In Russian that means barking dog. Maybe I foresaw something. [laughter]

DR. NELSON: Well anyway...

DR. LUBCHENCO: Well, I don't know how they found Harry Gordon. But Harry Gordon had been interested in prematures before, because he had already done this physiologic work before he went into the service. I think it was when he got out of the service that he began looking for a more permanent place. They found Harry Gordon, and Stewart Taylor had also done work on prematures. He had found that if a woman was carrying twins or triplets, that he could delay delivery by putting the mother at bedrest. So he had become quite interested in the prevention of these highly premature babies. So when the two of them got together, they started applying for a grant to set up a premature center. At this time [1947], this was already being done in New York. In fact several [premature centers] had been established in New York, so I think he [Stewart Taylor] was going to do the

same sort of thing in Denver. Ethel [Collins] Dunham, chief of child development at the Children's Bureau] was a good friend of his, and I think she was encouraging him to look for grant support.

DR. NELSON: She did some work at New Haven, I think...

DR. LUBCHENCO: She did do some work [there]...

DR. NELSON: She did work on the bacteriology of sepsis [Dunham, EC. Septicemia in the newborn. *American Journal of Diseases of Childhood*. 1933. 45:220-253].

DR. LUBCHENCO: She wrote the first textbook on premature care. [Dunham, EC. *Premature Infants: A Manual for Physicians*. 1st ed. Washington, D.C.: Federal Security Agency, Social Security Administration, Children's Bureau, 1948.] She was instrumental in Harry Gordon's career. So, he had that in mind when he came [to the University of Colorado]. As he [Harry Gordon] talked with Stewart Taylor, they realized that the logical thing was to combine their interests, so they applied for a joint grant for obstetrics and pediatrics. The idea in obstetrics was the prevention of prematurity. Knowing that you could put high-risk mothers at rest, they applied for a certain number of high-risk beds. Of course, Harry Gordon applied for the beds for preemies. So the combination was so logical. I think that's why I have been real proud of being a part of this movement, or fitting into this, because it did seem *so* logical. That combination was a real good one.

Anyway, now we get back to my first interview with Harry Gordon. At that time he was interested in getting his laboratory started again. What he offered me was...I think it was even a part-time job setting up a lab. I had to say, "I don't know a thing about setting up a lab." But they said, "You've got a biochemistry department here. They'll help you." All that they wanted to do was total protein and creatinine. On the [first] year in on these premature babies, that was the first thing. So that seemed simple enough to me. But you know, I went to the head of the department who was Bob [Robert C.] Lewis, so he said, "Oh sure, that's a good test."

DR. NELSON: That's why his name's on some of the papers...

DR. LUBCHENCO: Of course I didn't know anything about a lab, but maybe he should have known. Somebody should have known; they were working on microchemistry. But I had these great big flasks of all this stuff. So I think the advice I got was not great, and my interest wasn't entirely in the lab, I think. [laughs] So I really didn't accomplish much in those few months that I had trying to set up this lab. And it was only a few months because in July, they...

DR. NELSON: Of 1947?

DR. LUBCHENCO: July of 1947, the premature center became a fact. They were trying to fill some positions, and one of the positions they needed to fill was a pediatrician for the premature project, now that was the title that I had, pediatrician for the Premature Project [The Premature and Newborn Center]. Of course I thought that was a great idea, and it was a temporary position, until they found somebody who was really qualified. But you know, they needed to get this project going and funded and all of this.

DR. NELSON: So you dropped in the slot.

DR. LUBCHENCO: I dropped in the slot. Actually, that was one of those things that happens to people.

DR. NELSON: Fortuitous arrangement of circumstance.

DR. LUBCHENCO: It sure was. And I was like a fellow. It wasn't a fellowship, but for the whole time Harry Gordon was here I was like a fellow. I think that 3 years is about all that he was there. Three to four years was the maximum time that he was in Colorado. So I learned right from the ground up from Harry Gordon. Our department was very, very small. I mean we didn't have much money to begin with and we didn't have the people. Winona [G.] Campbell and I... Winona went into allergy, finally, and she also covered as a general for a long time, and then got her certification in allergy. But we were 2 general pediatricians that did a lot of the basic things that had to be done in the department. We had classes and these kinds of things. And we both had little children. Her daughter and my daughter are about the same ages. By that time, I think, we had a second one. It was in 1947.

DR. NELSON: A second daughter?

DR. LUBCHENCO: Yes, a second daughter at the very end of the year. In fact, both the first and second daughters were born on the 28th of December. They were *naturally* born on the same day. You know, that was an era when men didn't participate much in household things or the care of children. So the responsibility really was on us. But one time there came a time when...

DR. NELSON: Shall I tell you my horrible prejudice? I didn't think children should even come to the dinner table until they were 4 or 5 years of age. They weren't permitted to spill anything.

DR. LUBCHENCO: Oh, really?

DR. NELSON: Some of my friends said, "You just can't rear children that way. I said, "When I come home from the office I don't want to see puking things about me. [I'm a] terrible person! [laughs]

DR. LUBCHENCO: You were one of those men, huh? [laughs]

DR. NELSON: I was one of those men.

DR. LUBCHENCO: Well, Joe tolerated all this stuff, but he didn't have a lot of time with the kids, either. That was my job, and his was to be sure we had enough to eat and a place to live. So, there was a class that had to be taught at 8 o'clock in the morning. Harry Gordon usually taught that class, but he had a conflict and was trying to find somebody to do this. Winona and I went to him and said that we thought we could do it. We could get the kids off earlier to daycare, which was where we had them, in Child Village right across the street from the medical school. Harry Gordon looked at us and he said to both of us, "You've got responsibilities to your children, and it's going to be a real struggle for you to get here and give this class at 8:00am. I would rather have you come later with some equanimity. You're not gonna teach it." I mean, that's the kind of person he was. And I thought...

DR. NELSON: I remember meeting him later. His wife was sick, I believe. [I remember] how concerned he was. It was his prime concern.

DR. LUBCHENCO: Well, that made an awful lot of difference in our lives, both of us. Joe always was early – he was one of these early risers and often had 7:00 am meetings or patients. He actually did see patients in the office that early. So he would be off, and then it was a matter of getting the children off to school or, when they were real little, to get them to care. If you don't get them off and get them to school, then you don't have the peace of mind. We had live-in help. It was the only way I could manage. Later on we did that, but when the first two came along we didn't have live-in help. But there were a lot of other things that Harry Gordon instilled in us, and they all had to do with feelings and respect. You know one of the first studies he did while I was still around and that was finished was on self-demand in premature infants. Do you remember that?

DR. NELSON: I do remember, because later [garbled], wanted to change the way we handled babies at the hospital and he quoted Harry Gordon's work, [saying] why shouldn't we let the babies [feed] and see what would happen.

END OF TAPE ONE

DR. NELSON: We are talking a little bit more about the early days with Harry Gordon and his humane attitudes toward autonomy of individuals and

being sure that we respected their rights—including even the very small baby, maybe, being turned over the task of deciding when they were to eat.

DR. LUBCHENCO: So he also had interviewed a head nurse for the nursery. This was the new premature nursery, where we had some isolettes and things. One of the questions that he asked was, "Do you talk to the babies?" Or someone had said they talk to babies. And he said, "You know, I don't know whether that's important or not, but if a person's *willing* to talk to a baby, *that* is important." So I mean there were those kind of things. So she [the head nurse] was also very interested in doing this study on [what] we called self-demand, but it was a flexible kind of [feeding] schedule. So the preemies that were now able to take a nipple were the ones that were chosen for this study, and there weren't any controls or anything like that. It was simply a matter of what happens to these maybe 20 babies we studied altogether. And [Frank H.] Horton was one of the residents at that time who was involved in this study. My role in this, besides kind of watching and encouraging him to do it, was [that] I did the follow-up on these babies to see what happened later. With that interest, it really was going to work pretty well, except you would get a resident in there who just simply was so anxious that he could not stand it. He said, "You're going to feed this baby all he wants, whenever he wants?" And you know, he said "You're going to kill him."

DR. NELSON: [laughs]

DR. LUBCHENCO: He'd been brought up with this very strict feeding schedule. When someone like that came along who just couldn't tolerate it, Harry Gordon said, "The whole study is a matter of respect for this baby. We've got to respect the physician as well, and if he can't tolerate this, we won't do the study when he's here." We have to respect them too. I mean this was the kind of thing that he taught us.

DR. NELSON: I remember that in Thomas Rotch's study, they were called Rotch's slide rule babies, you know. It was so precise...

DR. LUBCHENCO: I remember, that was... Yes, that was right. During that time we were calculating to the cc how much these babies took in. We had been brought up like this. Al Washburn was one of these people who knew exactly how much a baby needed.

DR. NELSON: And when he needed it.

DR. LUBCHENCO: And when he needed it. Because this had all been figured out mathematically. I think he did change his mind, because I heard him say one time [when] there was a matter of do you give them breast milk.

His comment then was, "There's an awful lot in breast milk that we have not discovered."

DR. NELSON: [laughs]

DR. LUBCHENCO: I think that's important. I mean he did have an open mind. But that's what we were taught, to the cc of how much these babies needed. So it was no wonder that some of the residents really kept track of their feeding. We didn't have much else to offer, if you want to know the truth. We had nursing care, and we had oxygen and warmth, and food.

DR. NELSON: Well you know, Arvo Ylppö and those people said that use of sulfonamides early in the baby's career, when it was suspected that they were sick, would actually save lives. And I can't remember...

DR. LUBCHENCO: I know exactly what happened.

DR. NELSON: In Finland they wrote that study up and it's one of the classics of pediatrics, of course, that said if you wait until you prove they're sick, then they do die.

DR. LUBCHENCO: Yeah, too late.

DR. NELSON: It was too late, Ylppö proved that very point, said you have to...

DR. LUBCHENCO: Ylppö was a great man, wasn't he? Yes. Poor [William A.] Silverman really got caught on that. It changed his whole life, because that's when he said, "Look, this is not the way you do things. You've got to...but that's when he gave the sulfa drugs and got the kernicterus, as you remember. [Silverman WA, Andersen DH, Blanc WA, et al.: A difference in the mortality rate and incidence of kernicterus among premature infants allotted to two prophylactic antibacterial regimens. *Pediatrics* 1956;18:614-624]

DR. NELSON: Yes.

DR. LUBCHENCO: And he's been trying to undo that ever since, I think.

DR. NELSON: So that was your experience, beginning a newborn center.

DR. LUBCHENCO: That's right. At that time we didn't even think you could do IVs [intravenous therapy]. You know, we did clyses, we pushed...

DR. NELSON: At New Haven, we did clyses on that until one of the people studied the outcome and we found out the babies who didn't get clyses didn't get sepsis.

DR. LUBCHENCO: Oh, is that right?

DR. NELSON: Yes. I guess that was never published. Nevertheless I think that Dr. [Grover F.] Powers felt there ought to be more IVs. We began trying to get butterfly needles and various ways to get into veins.

DR. LUBCHENCO: Well, I don't know why we were doing this because in Rochester I learned how to do these IVs. Our chief resident is the one who taught us, and he was one of the first ones who could do IVs. I should have been a little more aggressive, I guess, about this, because I knew how to do those quite well before I left Rochester. But I was learning. I was learning a lot.

DR. NELSON: Well then, how long did you stay with the newborn center at the University of Colorado?

DR. LUBCHENCO: Fifty years.

DR. NELSON: Fifteen years.

DR. LUBCHENCO: 5-0. No, that is not quite that much.

DR. NELSON: [laughs]

DR. LUBCHENCO: I think, before we leave Harry Gordon, would you like to hear the story of retrolental [fibroplasia]?

DR. NELSON: Oh yes.

DR. LUBCHENCO: Because that was another big, big disaster that we faced. Well, I don't know exactly where to start. In 1947...

DR. NELSON: This has to be a change that you saw then when you had retrolental fibroplasia.

DR. LUBCHENCO: It was. When we started out in 1947, we were still in the same nursery which was adjacent to the... [stops to express concern over barking dog in the background.]

DR. NELSON: Don't worry about that dog.

DR. LUBCHENCO: I usually yell at her and she'll quit, or I can bring her in and put her in the...

DR. NELSON: Do you think she wants to come in?

DR. LUBCHENCO: No, she usually just barks at anything that goes by.

DR. NELSON: Oh I see, well that's all right. I respect her autonomy.
[laughs]

DR. LUBCHENCO: We have to close the door. Her autonomy, I should respect it, huh? [laughs] Well, we were in this little nursery, and I don't think we had more than 10 or 12 beds in the nursery with all kind of babies in it. We only had Gordon Armstrong incubators. But among the equipment that Harry Gordon brought, or got, at the time that he opened this nursery was an oximeter. Is that what you call it, an oximeter?

DR. NELSON: Yes.

DR. LUBCHENCO: And we could measure the ambient oxygen.

DR. NELSON: I remember them very well, [the] Beckman [oximeter]. It worked on the principle of a change in the electrical field on that little mirror in there. You read over here, and that was it. Is that what you had, the little Beckman?

DR. LUBCHENCO: I don't...

DR. NELSON: It had a little square box that pumped the oxygen through it?

DR. LUBCHENCO: I think that was what we must have had.

DR. NELSON: That was [the] Beckman, yes.

DR. LUBCHENCO: Yes, well we had that. And we realized that no matter how we tried, we couldn't get the oxygen concentration very high in the Gordon Armstrongs [the incubators].

DR. NELSON: [laughs] So you seal the bottom of them with tape!

DR. LUBCHENCO: But every time you opened it up you lost what you'd done. Well anyway, we were interested in having a high oxygen concentration because we realized that the apnea of prematurity, which we, I think, also call periodic breathing, would disappear in high oxygen. And we thought, "Well that's good, and oxygen is good." So we tried to keep the

oxygen as high as we could possibly keep it. Sometime between 1948 and 1949, I don't remember the dates, we had built a new nursery over on the OB side closer to the delivery room. Pediatrics was on one wing and obstetrics on the other wing, so we weren't very far apart. I think Harry Gordon's office was in between, kind of in a little solarium there. But the new nursery was over on the obstetrics side. That's when we got a lot more new equipment, including isolettes. So then we could get that oxygen up. We didn't use that oximeter much, kind of to see sort of where we were, and that was all. We never really monitored anything with it. We just, you know, such and such liter flow and you would keep the oxygen about so and so, you know, just...

DR. NELSON: We had a little device that had a flag, you know, and the flag would drop if you got below 40 or something like that.

DR. LUBCHENCO: Well that was later.

DR. NELSON: Oh I see.

DR. LUBCHENCO: Yes, that was later. Because this was in 1950, it must have been the early part of 1950, that we really began to see retrolental fibroplasia. It was [called] RLF at that time, and I think retinopathy of prematurity is a much better term for it. But I'm using [the term] we used then. But before we moved to this nursery, Harry Gordon got a call from [V.] Everett Kinsey, who was with the Massachusetts Eye and Ear Infirmary.

DR. NELSON: Yes.

DR. LUBCHENCO: They were seeing retrolental [fibroplasia] in the preemies. He was trying to get a feel of whether this [was] local or whether this [was] nationwide. Kinsey had also done a pretty good study trying to relate nursery practices and blindness. [Kinsey VE, Zacharias, L. Retrolental fibroplasia; incidence in different localities in recent years and a correlation of the incidence with treatment given the infants. *Journal of the American Medical Association*. 1949;139(9):572-8]. So Harry Gordon got this call and [was] asked what was going on in Denver. We had not seen a case at the time he [Kinsey] called. But that was an alert. We talked about this, and also it was the, a doctor at Hopkins, he and his wife were ophthalmologists. [William Councilman Owens and Ella Uhler Owens of Johns Hopkins University].

They were both ophthalmologists, and they realized, which I think none of us thought was possible, that you could actually see the retina in a premature infant's eyes. I mean, nobody did anything like that. That alert was enough that we thought we needed to be sure we didn't have it. He [Harry Gordon] just told Kinsey, "No, we don't have any. Maybe it's because we're a mile

high and the air is different or something. "Kind of jokingly, you know. But a little bit on the smug side, you know, [as in] "Boy, we had escaped this."

But in 1950 we had a resident in ophthalmology, who became one of my very close friends, who was Ivan [E.] Hix [Jr.]. He was very interested in learning how to do this, and he was very gentle and he learned how to dilate the pupils and take a look at their eyes. He kept beautiful pictures, he drew of what he saw in the retina of these [infants]. We weren't in that unit more than 3 or 4 months before we realized we not only had it, but we had a lot of it. I think Harry once said that out of a population of 20 there were maybe 10 that had changes, or you know, something. So we knew we had a problem. Of course we didn't know the natural course yet, but Ivan came and every week he would examine these babies and record exactly what was going on. We learned the normal course of the disease. He also picked up some other interesting things. He picked up a little kid with a retinoblastoma. I mean, just because you could look in the eyes! But at that point it was pretty clear that we had a problem and it probably had to do with our care of preemies. If that wasn't an anxiety provoking thought, that here you were the ones responsible for this. But what were we doing? You know, we were doing the best we knew how to do. And the thing that I shall never forget Harry Gordon doing... He was anxious too, and he had some real good friends in psychiatry. I guess he talked to them about it. The first thing he did was get a psychiatrist to come make rounds with us, or to give us some conferences, because we needed it, not the babies and not the parents. I mean, we really needed some help at that point. It was really out of these meetings where we could voice our concerns. We decided as a group--this was nurses, social workers, residents, faculty, all of us who would attend these who were interested... We decided we didn't have it in the old nursery. I had been following these in the well baby clinic, you know, after they went home. I was quite, you know...you can't miss a blind baby.

DR. NELSON: No.

DR. LUBCHENCO: But now we had it. So, we would go back to what we were doing in 1947. We went through everything methodically, but Kinsey also had published this article showing nursery practices that seemed to correlate with retrolental. Iron administration was one. Water-soluble multivitamins was another one. And oxygen. We said of course it *couldn't* be oxygen.

DR. NELSON: It was the one! Yeah, it couldn't be the others. [laughs]

DR. LUBCHENCO: It couldn't be oxygen. But we didn't exclude it. I mean, it was in there [the Kinsey article]. If we were going to go back to 1947, we had to include all of these things. We had a formula room at that time, and they made up this Alacta, it was half skim milk. So they began washing the

bottles with soap and water, not detergents, and anything that had detergents in it. The Poly-Vi-Sol or Tri-Vi-Sol, or whatever we were giving, we went back to Oleum Percomorphum. Was that it?

DR. NELSON: Yes. Oleum Percomorphum.

DR. LUBCHENCO: Which was good old cod liver oil.

DR. NELSON: Cod liver oil.

DR. LUBCHENCO: So we changed all of that. Then it came to oxygen. And that took a lot more talk and a lot more help from the psychiatrists. But the nurses had said, "We think that the babies who had not been in high oxygen were easier to wean off oxygen than if they had been in high concentrations." I don't know whether that was valid or not, but that was a feeling that they had. We were willing to try almost anything at that point, so we decided we would go back to the oxygen concentration we could get in a Gordon Armstrong [incubator]. That's where the 40% came from. So, that's what we did, and we decided we would do this. It really was only 3 or 4 months before we realized there was a difference in what we were seeing, and that was [at] the end of 1950 [into] 1951. So we had a lot of it, but we had it for a very short time, thank goodness. So Harry Gordon wrote about this change with the use of oxygen and what we had done. But that was after he had gone to Baltimore. I've forgotten which hospital, but this article he wrote on oxygen came out in the *Johns Hopkins Review*, or something like that. [Gordon HH, Lubchenco L, Hix I. Observations on the etiology of retrolental fibroplasia. *Bulletin of the Johns Hopkins Hospital*. 1954;94(1):34-44] They had, I guess again it was Kinsey, who was organizing these meetings to do a multicenter study of oxygen concentration. Harry Gordon was there, I was invited, and I think it was Dick [Richard L.] Day who was there [and] who felt the same thing. He said, "When you see a baby that has had low oxygen and doesn't have retrolental [fibroplasia], you have to think about this." So we all felt that... And there were some nice animal studies and a very small human study at Hopkins [that] all pointed to oxygen. So when the time came to join or not join this multicenter thing, there were several of us who said no. We were called unscientific, biased...you know, things that you would say about a person who would not want to test this. But we felt like there was enough reason *not* to test it.

DR. NELSON: You were already backing off.

DR. LUBCHENCO: But that was not the end of the story because, by that time we had a new professor. It was Bob [Robert Hamilton] Alway.

DR. NELSON: Bob Alway.

DR. LUBCHENCO: Bob Alway could see that going into this study—I'm interpreting from the past how he must have felt—[that] going into this multicenter study, really meant new positions, it meant new money, it meant a lot to the department, which was struggling with funds anyway. He knew how I felt. It was almost on the eve of our joining this that I thought, "I can't do it. I don't know...if he can do it, alright, but I just can't do this. I've seen what these babies look like, I followed them, and this is not something my conscience will let me do." To myself I said all this. So I went in prepared to present all of this to him, practically on the eve of joining this [study]. I had several books and it was going to be a showdown, I felt. I was very anxious. I came in there and he said, "Put that all down, we don't need to talk about this." He said, "I had a long conversation with Clement [Andrew] Smith last night." [laughs] And he says, "Clement Smith says don't join it." So I don't know, maybe [Children's Hospital] Boston didn't join it either. But anyway, it was Clement Smith, not anything I had to say. We didn't go into it and we lost all this money and all this sort of stuff. But we didn't, so that's the story of retrolental [fibroplasia].

DR. NELSON: Well that's a very good story. Now I'm sure you saw some other changes. You mentioned Alacta. You were still on Alacta at that time?

DR. LUBCHENCO: Yes. Well, that came with Harry Gordon. You know.

DR. NELSON: I know. But with Bob Alway, now what changes did you see at that time?

DR. LUBCHENCO: You know, the changes in feeding came about real slowly. Bob Alway was head of the nursery, because I was still kind of an instructor or something, but I didn't have a lot to do with this. I had to run it, but he was kind of there. And he wasn't that interested in the preemies.

DR. NELSON: He was more interested in older children.

DR. LUBCHENCO: Yes, I think so. He thought as long as things are going all right, he didn't much bother about this. So we kind of changed as Harry Gordon changed, even though he was somewhere else. I did some studies with Donough O'Brien that never got published, again because it was Clement Smith who said, "I think you really need to think about this." Or, [Dr. Alway said] it'll get published somewhere, but he just didn't think this was a good time or good data that we were presenting. But we were doing nitrogen balance studies. [Butterfield J, Lubchenco L, O'Brien D. Patterns in electrolyte and nitrogen balance in the newborn premature infant. *Pediatrics* 1960;(26)5:771-791]. I think showing how these preemies utilized every tiny bit of stuff that we gave them... You know, I think changes came pretty gradually.

DR. NELSON: Want to stop for about a minute.

PAUSE IN TAPE

DR. NELSON: We had to take a little break here. I brought up a new subject now, on the changes that occur in the way we look at prematures in a premature nursery, a la [the] Lubchenco charts. The study of growth and development in the premature in relation to plans we make for a baby when we see it...

DR. LUBCHENCO: Well the end result is sometimes very different from the way you start out, I guess. My interest—again, stemming from Harry Gordon—was really in feeding. I was concerned about this terrible dip after birth and then slow growth again. And...

DR. NELSON: You didn't think Joe [Joseph] Dancis [creator of a grid used to record the weight of premature infants] was right to have that type of thing.

DR. LUBCHENCO: Well, we didn't have anything else. You know, and I think I questioned it. When I had these kind of questions, I usually went to the Child Research Council. So I guess I might have talked to Washburn first, and I was on real good terms with [Marion M.] Maresh. She was more interested in x-rays. They said the person who's really interested is Edith Boyd. So that's when I started talking with Edith Boyd. And Edith Boyd was a very clear thinker. I said, "Edith, maybe we should think of the ideal growth of premies as intrauterine growth. Do you have any information on this?" Because she was really the growth and development part of the...

DR. NELSON: At that time, were you both looking at [Richard E.] Scammon and [Leroy A.] Calkins' [data]?

DR. LUBCHENCO: Exactly. Exactly.

DR. NELSON: I suspected that. Knowing Leroy very well.

DR. LUBCHENCO: Did you?

DR. NELSON: Oh yes.

DR. LUBCHENCO: And that's when Edith Boyd got out Scammon's curve and said, "Now this is an intrauterine growth curve, and it's based on weight and gestation. It's a mean, and it's only the mean." Then she said, "You know, growth isn't like that. I think you should make a curve that shows some of the variations from the mean, as well." I thought, "I have enough to do without doing that." [laughs] Then I thought of my secretary, June. I said, "June, we've got all of this on cards, don't we?" And Edith thought

that we should make a scattergram. This was her first suggestion, to make a scattergram of individual babies. So we could do that whenever we had time. We just went through the cards that we had, keeping record of the premie. So we ultimately made a scattergram of all the premies admitted over, I don't know how many years? Maybe 2 or 3 years. It was a revelation. The revelation was that 2,500 grams was the cutoff for admission to the premature nursery. So we had a nice scattergram, but it just stopped right at 2,500 grams. That wasn't going to do anybody any good. I could even recognize that. So I went back to Edith Boyd with data. We talked about it some more, about how important she thought it was to have an intrauterine growth curve that showed some normal variation in weight. I said, "Edith, I've got all this responsibility in the nursery. You know I've done this bit that we could do. I simply don't think I can do it. I don't think I've got enough hours that I can start doing that. There are charts, you know, for all of the deliveries, and we may have to pull charts to get some of it..." [laughs]. I tell you, I gained a reputation fighting with the record room.

DR. NELSON: [laughs]

DR. LUBCHENCO: I said, "Whose charts *are* these?" Because I wanted a lot of charts! That was when she said well maybe there's someone here in the department who would be interested. It was Charlotte [F.] Hansman in the Child Research Council.

DR. NELSON: I was going to ask you.

DR. LUBCHENCO: Yes, so she said Charlotte would do that. So what Charlotte did was she came in every morning before she went to work in the Child Research Council. The record room had pulled so many charts, and she made cards.

DR. NELSON: Oh my goodness.

DR. LUBCHENCO: With very little bit of information. It had the name, the estimated gestation, the birth weight and, maybe, if they had any growth abnormalities. But that was essentially all in the date of delivery and stuff, on these cards. What is it, 3x5 cards? After she got 1 or 2 years data, we went to making another scattergram. [laughs] Then this one really was interesting. I've forgotten how many years of data went into that, but we had a pretty significant number. I'd have to look at the article again. All of this was with the idea of a growth chart that we could plot premies against. I mean that's really the way it started out. Then a lot of things happened from then on. Well anyway, we made this scattergram—I think I was involved in doing that too. This time the scattergram covered the whole spectrum, the whole birth weight - gestational age spectrum. We picked out a median real easily. We had the cards lined up by each gestational age, you know. And so

we just count the cards, and that was the median. You know, [if] there are 20 cards, No. 10 is the median. And if we had 50, it was 25. And so we went through each. Not only that, we did a 25th and a 75th [percentile], I think. Anyway, we did a little more than that to begin with. Edith Boyd helped us with every step all across the way. I guess we finally went back and got the 10th, 25th, 75th and 90th. So, again, it was just counting cards, you know, and we would put it all there. Then I learned how you smooth...

DR. NELSON: A curve.

DR. LUBCHENCO: Smooth a curve. You do a 3- point smoothing. In other words, you take 3 gestational ages and you average them. Then that's there. [Then] you go to the next 3, and the next 3. I mean, we did all of this by hand. So that's how we got the curves. Then what we found in these curves was something really very interesting. There were clusters of babies at like 26, 28, 30 weeks' gestation that were full-term births. So my contribution was, again, either to review the charts or see the children in that cluster to see if they were, in fact, prematures or [if] there was some error. We found most of them acted like full-term babies. They went home in 3 or 4 days, or maybe it was 7 or 8 days at that time. They were eating well...it was obvious they were not 26 weeks.

DR. NELSON: Yes.

DR. LUBCHENCO: So Edith, again, with all of her statistical knowledge, said when you find something like that in physiologic data, you just put a circle around it and say this is a cluster that for some reason doesn't belong here. That's how we took out those aberrations that we examined. Then [we] went ahead and smoothed the...

DR. NELSON: Did you reexamine them in any way, or just take them out?

DR. LUBCHENCO: We just took them out. That was the stated gestational age, we had no clinical estimate at that time, you know. No, that came quite a bit later. That's too bad we didn't have a clinical estimate, because we would've been much better.

DR. NELSON: Well everybody didn't read French and realize how [unclear] made a pretty good study about estimating babies...

DR. LUBCHENCO: So anyway, then we realized for that first scattergram that there were a lot of babies under 2,500 grams that were full term. That was kind of the first inkling that these babies were not prematures. We *knew* that they acted differently from the prematures.

DR. NELSON: Now they'd call them "restricted growths."

DR. LUBCHENCO: Yes. [laughs] I'm surprised it's not "challenged."

DR. NELSON: Well, I think there'll be people who really feel restriction happens, you know.

DR. LUBCHENCO: Well, anyway, that was part of our... You learn a lot when you do it. I mean, we learned about these [babies] that were outliers, and then we learned about these that were term babies that actually were that gestational age.

DR. NELSON: Now you talked about Edith Boyd and you talked about Hansman and you talked about, earlier in your life, Dr. Palmer, and some of the others. Were there any other people that you were being involved with at that time? Those are the main ones?

DR. LUBCHENCO: Those are the main ones.

DR. NELSON: Those are the main ones. You talked quite a bit about people who helped you with your career, particularly Dr. Gordon. Did you get involved with AAP [American Academy of Pediatrics] at that time?

DR. LUBCHENCO: No.

DR. NELSON: Why not?

DR. LUBCHENCO: No. I think I was not far enough along in what I was doing.

DR. NELSON: You didn't see how you [would] relate. Well, the reason I have to ask you that question [is] you had a lot of academics who believed that the American Academy [of Pediatrics] was rather a gadfly.

DR. LUBCHENCO: Well I don't think I felt like that. I thought it was kind of for the senior faculty. [laughs] You know, because the faculty was not as involved as the people in practice. They, somehow, I think were more influenced by the institution than they were by the Academy. I really got involved, I think, more through retrolental [fibroplasia]. Then you got to realizing that there was an organization out there that had to do... Well, I knew about it because you had to know about it to take your boards [American Board of Pediatrics certificate examination]. And I did go to some of the meetings along about that time. I did go to some of the Academy meetings. Again, it was retrolental [fibroplasia]. That was when I really began to realize what it was. I would go to these meetings, because I *wanted* to know what was going on.

DR. NELSON: Did you go to SPR [Society for Pediatric Research] meetings?

DR. LUBCHENCO: Yes, I may have done that too.

DR. NELSON: Well some people have felt that SPR...

DR. LUBCHENCO: The senior faculty might get their way paid, but you almost had to have a paper to get your way paid. Most of us couldn't afford it. That was another limiting factor there. When I finally got a paper for retrolental [fibroplasia], I started going pretty regularly after that.

DR. NELSON: Were you associated with any other medical organizations, other than AAP [American Academy of Pediatrics] or [the] AMA [American Medical Association], [or] anything like that?

DR. LUBCHENCO: As I look back on it, I think I was hard put to get my daily work done. I just think I was more absorbed in that and a family and, you know, this kind of thing. It wasn't lack of interest, so much, as I just felt like I had all I could handle. Now I did get... As I said, after retrolental [fibroplasia], I got much more active in these organizations, and I finally became a member of the Committee on Fetus and Newborn. Then I really...

DR. NELSON: Now wait a minute. You said you weren't involved, and here you were a member of the fetus and newborn committee, that's...

DR. LUBCHENCO: Well I belonged in name, but I'm not sure I was a real participant until retrolental [fibroplasia], [and] other things that I really wanted to talk to people about.

DR. NELSON: Today we have a perinatal section [AAP Section on Perinatal Pediatrics]. But at that time there was no perinatal section.

DR. LUBCHENCO: No, but it was [the] Committee on Fetus and Newborn [that] was the closest. Yes.

DR. NELSON: Of course, some of us felt that they only were partly functioning. They missed a whole lot of issues, and that's the reason we have the changed structure that we see today.

DR. LUBCHENCO: Well, before I left the committee the whole business of classifying newborns came up. It never would have been even attempted without Bill Silverman. I just was not firm enough spoken to really make this carry. It was Bill Silverman who had a big influence too.

DR. NELSON: So then Bill Silverman was at least a scientific model.

DR. LUBCHENCO: Yes.

DR. NELSON: Scientific medicine.

DR. LUBCHENCO: He sure was. Yes. And you know, early on...

DR. NELSON: But the direct help in your career was mainly Harry Gordon.

DR. LUBCHENCO: Yes. He was a real academician at that time. You know, Clausen was well respected, but he was kind of a retiring person. He was not much of an outgoing person. So, he was head of the department [of pediatrics] in Rochester, but he was kind of involved in his own little realm. We saw him on rounds and that was kind of it. But I think Harry Gordon, being full time and noted for his work, really did make you realize that.

DR. NELSON: Well, we've gone through quite a bit. Let's talk about neonatology now. You've talked about yourself as a pediatrician entering into this area, and going through a fellowship of sort of the Colorado making out here. What was the earliest time when you said, "I am a neonatologist?"

DR. LUBCHENCO: You know, I still have a little trouble today. [laughs]

DR. NELSON: [laughs] Still has trouble.

DR. LUBCHENCO: The intensive care nursery was not exactly the thing that drove me. It was the babies that really did. So I feel, in many ways, more like a general pediatrician even today. I'm sure not passing the boards had something to do with it! [laughs] I realized that part of that was I have never done well on standardized tests.

DR. NELSON: I'm the little guy that tests well.

DR. LUBCHENCO: Yes, well I never...

DR. NELSON: You got the test where...

DR. LUBCHENCO: I knew the answers to lots of these [questions]. I knew the answers back and forth, and some of the most difficult ones that I had [dealt] with growth and development. Just because I'm not really very good at test taking. But that's only part of it, because I really did not continue to keep up with the intensive care that was going on, and I'll tell you why. I thought, to me, the challenge in the newborn field was recognizing a sick baby when you saw this baby. Then once you sent them to the nursery you knew already what they had. I mean, you'd already made the diagnosis and

you knew they had respiratory distress or you know they had sepsis. It was then a matter of the care that they got there. I'll tell you when this changed. This changed when Joe [L. Joseph] Butterfield was with me, and the question came up do we need 2 people. I was very content to take over the full-term nursery and let Joe have the intensive care. It wasn't even called intensive care at that time.

DR. NELSON: Graduated care?

DR. LUBCHENCO: It was just the preemie nursery.

DR. NELSON: Preemie nursery.

DR. LUBCHENCO: No it was not the graduate[d]. I liked the...

DR. NELSON: [I] was talking about Murdina [M.] Desmond's terminology, the graduated care of the newborn, [of] the sick newborn...

DR. LUBCHENCO: No, it wasn't that so much as I liked the newborns as they were born. Not the later care or the intensive care. I really found myself so embroiled in that, and the more I was with that, the more I felt that. Maybe I should say this is really where I think I may have some effect. So, I not only got interested in the term babies, but I got very much interested in mother-infant bonding and this sort of thing. So infant newborn behavior really became upper-most in my mind, because that's how you could pick out who was sick and who wasn't. So the latter part of my time was really spent working in that area. I kind of need to go back a little way though. Maybe I'm not following your schedule, but...

END OF TAPE TWO

DR. LUBCHENCO: I really enjoy what is going on and I really kept up with this, but not hands on so much. But this was hands on. I'll tell you when that change occurred in our nursery. It occurred when [C.] Henry Kempe was chairman. When he brought Donough O'Brien here to set up a microchemistry lab. I actually felt like he brought Donough O'Brien for me, because we were the ones in the preemie nursery who really needed his help. You know, somebody would say, "Well we've got to get a glucose on this baby." It might be a 1,000 gram baby, or 1,500 grams. Even then [that] was pretty small, and we would have to take 10 ccs or something like that.

DR. NELSON: Oh no!

DR. LUBCHENCO: So, essentially what we were doing was we were treating these babies without any lab backup at all. Because we [laughs] couldn't exsanguinate them just so we could treat them. We did do a lot of blood

transfusions, I tell you, at that particular time. Because we were following hematocrits and that's all we knew to do. But when Donough O'Brien came to set up a microchemistry lab I thought, "Oh, thank the Lord. Here's somebody who's gonna help us do something with some support." So his first test that he set up in his lab was glucose, because that was something, of course, being interested in feeding and growth... Our routine for feeding was awful. I tell you, Harry Gordon had a lot of good ideas, but he was following a terrible course there, which even Clement Smith kind of backed. Because they were afraid they were going to aspirate. So we withheld feedings—fluid or milk—for 1 day, 2 days, 3 days, longer.

DR. NELSON: [garbled]

DR. LUBCHENCO: By that time, I tell you, it was terrible. I think that's another reason that I was so intent on getting an intrauterine growth curve. I just didn't think this great departure from it was healthy. So Donough set up this micro glucose lab. So they came to the nursery and they just took a whole bunch [of samples]. We didn't have to get permission from anybody, and we wanted that result. I think we took kind of a survey of the nursery, you know...went from one bed to the other. Most all of them came back so low that it was startling. I thought to myself, "I'm not surprised. I think that's what's been going on all this time. That's why we needed glucoses. So I was really excited, saying, "Boy, now we've got some reason to change." Change our feeding routine, you know, whatever we were going to... And Donough, in his wisdom, [he] and his technician said, "Oh, no, that's a lab error." [laughs] He had to re-do the tests...he had to re-do the laboratory, then, rather than do these babies. So that, really, was the beginning of intensive care. Because then he set up other things like blood gases. You know they were slowly coming, but at least we had *something* to go on in terms of our treatment. About that time, we had a visitor who spent a month or something with us, and it was Segal from Canada. What's his first name? Sydney. Sydney Segal He was interested in respiratory things. He was showing us how to use a respirator, but you had to adapt these adult respirators to babies and...

DR. NELSON: Oh yes.

DR. LUBCHENCO: ...before we had any others. So that really was the beginning of the change, and that was early in Henry Kempe's era. I can't give you a year, I'm not very good at that.

DR. NELSON: With Segal, we're getting up in the late 1960s, early 1970s now.

DR. LUBCHENCO: Yes I think so. But anyway he came to help us. I think Ernie [Ernest K.] Cotton was one of his students at that time. But Henry

Kempe really did make a lot of difference in this. So with each of these changes came differences in treatment, and I was just really excited about this.

DR. NELSON: We've got to turn a little bit and look at the future now. Where do you think we're going?

DR. LUBCHENCO: Well, I need to tell you a little bit more about what was going on in the newborn, because that kind of was close to my heart. So when Joe Butterfield then kind of took over [the premature nursery] with Donough O'Brien, and I took over the full-term nursery, I realized how many babies under 2,500 grams were kept in my part of the nursery that ought to be in there, but they couldn't be in there because of this 2,500 gram limit.

DR. NELSON: Oh.

DR. LUBCHENCO: Which was, I think, a part of the agreement with the Children's Bureau. I think that's when Joe Butterfield also was a big supporter of taking care of all newborns instead of [those] just under 2,500 grams. He or I had *all* the SGA's [small for gestational age infants] in the full-term nursery that we were trying to take care of. We had all of the infants, of diabetics, we had all...I mean, we had a sick nursery there that didn't get to the preemie nursery. So it was a real challenge, in that respect. That was another change that occurred, but it didn't really occur until after Joe [Butterfield] left. I think by that time Joe [Joseph V.] Brazie and I worked together as co-directors. I still made rounds in the preemie nursery and I still understood all that was going on and [was] excited about now being able to treat these babies. But, again, my interest was more in the other nursery. But at that point, with Joe Brazie's help too—and Joe Butterfield did it at Children's, he just went over there and overnight he said, "This is a newborn nursery and there's no limit on it. [It is for] any baby who needs care." We both learned that, I think, especially during that time when I had charge of a *really* sick nursery. You know, lots of high-risk babies who were not eligible for care.

DR. NELSON: But now you had the high risk...

DR. LUBCHENCO: Then there was another thing that happened during that time. Actually it was still before Joe Brazie came, but Henry Kempe was there. Henry Kempe he was... I mean, I happened in on a lot of other people's visions, and this was one of those [for which] I'll forever be grateful. He brought Edith [Banfield] Jackson, who retired from Hopkins and lived in Colorado, and he apparently knew who she was and the work she had done at New Haven. Remind me some time to tell you a story about Harry Gordon and New Haven; we won't do that now. But, he brought Edith

Jackson there to see if she would like to set up a rooming in unit, in our OB [obstetrics] service. That was with OB's recognition, and they thought that was a very good idea. Well, as it happened, June Reinhold's husband came here from England and almost within the first month was killed in an automobile accident. It was just awful. June had been a nurse in Britain. So Henry Kempe hired her to work with Edith Jackson. They set up a little 4-bed ward right on the OB floor for mothers rooming in. Edith Jackson would make rounds, and I would make rounds with her. I tell you, it really began to give you a totally different idea about what goes on in a full-term nursery and what needs to go on in a full-term nursery, and how these mothers loved this rooming in [concept]. So when we moved to the present university hospital, Joe Brazie then sort of designed that unit, and I had the other unit. We had a beautiful rooming in unit there, just like she had it in New Haven, for mothers on either side of a small nursery. That turned out to be one of the highlights in my life, because it was a wonderful opportunity for residents, nurses and, mostly, child health associates—which was Henry [K.] Silver's contribution to this—to work with mothers and babies simultaneously in the same unit. It was one of the best teaching units we had. And Edie Jackson kept on making rounds with us.

DR. NELSON: The changes that occurred in New Haven with Dr. Powers dropping down and the control passing over to a person more behaviorally oriented was quite a dramatic thing.

DR. LUBCHENCO: Well, you would be interested [to know] that when I retired, so did the nursery go...the rooming in unit. Even as of today. Their excuse was that we have rooming in for everybody, but it was not the same. The people did not get the same experience that they got when they actually worked in the unit where mothers and babies were together. But, anyway, that was really a highlight in my life. I loved that, and I loved Edie Jackson's contribution to this. It led us into some very nice studies on mother-infant behavior and father-infant behavior. As soon as we started letting fathers into the delivery room, I could see a difference in what was happening to these babies and what was happening in the clinic. We had never had a father bring a baby in before. I mean these fathers got bonded just like the mothers did if they were there. It was a great experience. That's what's wrong with your children! [laughs] Or were you in the delivery room?

DR. NELSON: No, I didn't go to the delivery room.

DR. LUBCHENCO: Of course not. Joe never went to the delivery room with me.

DR. NELSON: Well you know, the Europeans never did that. Europeans still don't. [garbled] It was not a good plan at all, I know that now. We did get that covered very well. What about looking at the future? Because some of these

things have common...we've put in a newborn center and it's very much this way in our newborn center. Built that way, where the mother and baby could be together the whole time unless she *elects* to have it otherwise.

DR. LUBCHENCO: That's right, it needs to be wanted. I think the majority of mothers do want this early contact with their babies.

DR. NELSON: Well, we're looking at the future. Mothers do want this; that's sort of where we're going. Do you think we'll do what the French are doing and give mothers more time around pregnancies? So they're not thinking, "Well, I have to go to work next week." You know the French now, if the woman has any pregnancy problems she is permitted a full month before she delivers just to sit at home.

DR. LUBCHENCO: Well I think there are far more countries ahead of us in terms of care of that. And I...

DR. NELSON: Well they did it because they found when they did that there was a decrease in the number of pre-term births, and that offset the cost of the pre-term birth, having the mother have to stay home then with a small infant!

DR. LUBCHENCO: I was going to say...

DR. NELSON: So they said, "Why not send her home [now]?"

DR. LUBCHENCO: You know, Joe Butterfield and I were both at this conference in Paris, that had to do with follow-up of preemies. There was a woman there, I can't remember her name, but she gave a beautiful paper on how environmental factors, including occupation, affects premature delivery. She cited one study after the other, [including] how nurses in different occupations, because they're on their feet a lot, you know, what their fatigue is, and... I think she brought out how other countries are way ahead of us in handling this. I think that *is* going to be something that is going to happen. It's already being talked about in the legislatures. Pat [Patricia S.] Schroeder [U.S. Representative from Colorado from 1973-1997] was a great advocate of mothers and babies. I think she did a lot to start this. I mean it's so logical. I worked in Yugoslavia for over a period of 7 or 8 years with a project there, and they gave mothers *and* fathers time off for delivery. It was something like 3 months or even 6 months, and they could split it any way they wanted to. They could both take off for 3 months and raise this baby, or they could take off before delivery. I mean it was up to them.

DR. NELSON: What was the birth rate there, though? Had their birth rates dropped, and they were trying to prime up the birth rate?

DR. LUBCHENCO: You know I don't know that. But I don't think it was...

[PAUSE IN TAPE]

DR. LUBCHENCO: Other people who have some influence? Marshall [H.] Klaus was very important in my mother-infant and father-infant work. Then [T. Berry] Brazelton has been very important, because I've learned a lot from him. We have used the Brazelton [evaluation tool used to assess the physical, neurological and emotional well-being of infants]. In fact I didn't get through all of the course with Brazelton, but I...

DR. NELSON: I want to be sure you understand that I'm one of that group that believes he should have credited the French with a great deal of the things that he credited for himself.

DR. LUBCHENCO: Well, he just used everybody else's data. I think so many people do; maybe they don't give the right credit.

DR. NELSON: I guess plagiarism is justified in the care of children, and I don't think that's wrong.

DR. LUBCHENCO: Well. I think he has more than just a view. Because I think he has opened our eyes to the fact that there are infant behaviors that we recognize, and really can act on. I think Heidi [Heidelise] Als, a researcher at Children's Hospital Boston, has elaborated [on] that in the premature. You know she can identify what it means when a baby is sort of stretched out or stiff. There's a lot of behavior that you don't recognize unless you are taught to look for these things and what they mean. You can find a preemie of 1,000 grams [who] is stressed, and you probably know how to avoid that stress. I think that contribution has meant a lot to me. In fact, Perry [M.] Butterfield's work today is an extension of both of these things. So I think there's so much that we need to learn about newborns than we know. As far as I'm concerned, neonatology includes the full-term newborn. It's not generally thought of [in that way]; if you're a neonatologist you're in [an] intensive care nursery. But this is where I really feel like I'm a neonatologist. Because I'm aware of exactly what's going on in that intensive care nursery, but I'm also much more aware of what's going on in the term babies than most neonatologists who call themselves neonatologists are.

DR. NELSON: Well, so you think neonatologists—some of us in the research field—are not true acting neonatologists.

DR. LUBCHENCO: No, no, I think research is part of neonatology. We wouldn't be where we are [without it]. No, I believe in research. But I think that the researcher and some people who are just in an intensive care nursery have limited their knowledge of what's going on in the rest of

newborns. If neonatology is newborn--which I think it's meant to be—it ought to include *all* newborns. You see, I'm on my bandwagon now.

DR. NELSON: Well, you've answered my question, [about] how the name neonatology was created. Do you like the name, and would you have chosen another name?

DR. LUBCHENCO: Well, I don't have any problem with the name. I just think that in theory it includes all newborns, but in practice a part of the newborn population is being neglected.

DR. NELSON: And isolated.

DR. LUBCHENCO: Yes.

DR. NELSON: They [those focused on the intensive care of premature infants] have isolated themselves.

DR. LUBCHENCO: That's what I think, yes, from the full field. That's why when I wrote the book, why I could not do it just on premature infants. [Lubchenco, LO. *The High Risk Infant: Major Problems in Clinical Pediatrics*. Philadelphia: Saunders; 1976.] That's what I was supposed to write it on. Finally I said, "You know, I can't do it because it [neonatology] includes all newborns." That's why we made a graph of full-term babies as well. I mean that's why we did the whole intrauterine spectrum.

DR. NELSON: What are the features [that] you think put neonatology on the map, though?

DR. LUBCHENCO: Oh, I'm sure the intensive care nursery has put it on the map. Because that's the most dramatic, and so much of the new research has led toward that. I think it's great. I get excited about the new things, [and] I really got excited about surfactant. My role in surfactant for instance, has been the follow-up. Because...

DR. NELSON: Because the research in surfactant was a big...

DR. LUBCHENCO: It was a big change. You see, I've been doing statistics in the nursery from the time it opened. So all at once [in] this one year, I saw all these tiny babies surviving where they had not been. Having done this year after year, you pick up these trends. So the last study that I was involved in was just fairly recent with Ed [Edward] Goldson. I said, "We don't know what's happening to these tiny babies." We just chose that one year to follow up and see what had happened. [Lubchenco LO, Butterfield LJ, Delaney-Black V, Goldson E, Koops BL, Lazotte DC. Outcome of very-low-birth-weight infants: does antepartum versus neonatal referral have a better impact on mortality, or long-term outcome? *American Journal of Obstetrics and Gynecology*. 1989;160:539-545] It's fascinating

what's happening.

DR. NELSON: What do you think made neonatology move away? Just the fact it got tied down with intravenous feedings, and ventilation?

DR. LUBCHENCO: I think it's the excitement of intensive care. You know, that's enough. Here's a baby who, if you're gonna save [him or her] you've got to be there minute by minute to monitor this baby. I think it certainly is the most exciting part of this. The other [work], I think, is just as important. It's slow and it takes a lot of time and it takes just as much skill, but in a different way.

DR. NELSON: Do you think neonatology should have ever developed [as a specialty]? Are you pleased that it developed?

DR. LUBCHENCO: Oh, oh yes. I think all of these developments are helpful.

DR. NELSON: But as a sub-specialty. Do you think it was necessary? Or should we have done it some other way?

DR. LUBCHENCO: I don't think there's anything wrong with the sub-specialty. I think it should...I just think it ought to include more term babies. [laughs]

DR. NELSON: I see.

DR. LUBCHENCO: And it should include follow-up. That's really the other area where I spent my time, was in follow-up. And...

DR. NELSON: That's where I spend mine now, so I appreciate it very much. We have staff, maybe about 7 or 8 of us now, and I talk to them. "Say, did you think when that baby was in there, he wouldn't feed, and [garbled] you might have wanted to know a little bit more about him?" You know, instead of [getting] him out of the hospital and [sending] him home.

DR. LUBCHENCO: That is the only thing. But you know. I noticed that follow-up is now [becoming] more and more of a requirement, and that is a good trend.

DR. NELSON: I say, "Well, why didn't you have some assessment done on the baby before he left rather than me having to do it now, and having to answer questions of parents that we might have answered earlier?"

DR. LUBCHENCO: Exactly. It ought to be done before discharge, I agree. And they have good tests now. There are some really very good tests that you can do on a baby ready to go home that [are] predictive. That was

another follow-up study. Before we get to the future, which you see I have some feelings about [laughs], I probably ought to tell you how I got involved in follow up, because that's been a big part of my life. You know, it's been almost as important as the care in the nursery. It started back with retrolental [fibroplasia]. That's when Kinsey asked if we have any retrolental [fibroplasia] and we said no. Then it was up to us to find out do we really have it, and especially since we now had Ivan Hix who could examine the eyes. So that really became the first follow-up study we did. We didn't have a dime, you know. Under Harry Gordon, it was just barely a department. So we didn't have much money. This was actually 10 years later, and we still didn't have much money. I'm sure didn't have any money for follow-up. But in the preemie center, social workers were a part of the entire design, when Harry Gordon and Stewart Taylor designed this. They had social workers who were a part of this, because most of our patients were indigent.

DR. NELSON: People actually assigned to that particular task and not to be doing something else?

DR. LUBCHENCO: Well, that's right. They actually were half-time [employees] in the nursery; we had 2 [social workers] who were half-time. The other half [of their] time fortunately or incidentally, happened to be there covering statewide crippled children's clinics. So we had babies transported in from all over the state. We were in close communication all the time because they were in the nursery half time and then they were at crippled children's clinics. So they would come back from a trip out in the hinterlands in Colorado and say, "Would you be interested? We just saw baby so-and-so who was a baby here in the nursery, [and now] was in crippled children's clinic." And I said, "Yes. That was real interesting. What was the problem?" Then, when this happened several times, they and I thought that maybe we've got more problems than we thought we had. That's really how we got to start it, saying, "We've got to know how much trouble we really do have out there." Because [Julius] Hess' work, you know, in Chicago, painted a pretty rosy picture of the outcome of tiny preemies. It was one of the stimuli that got preemie centers going. We wondered if Hess might be wrong, or what's the difference. So we didn't have any money, so what we did was asked different members in the faculty if they be interested in seeing what's wrong. How's the hearing? How are the eyes? If we brought these [children] back, wouldn't you like to examine them? And wouldn't you like to know neurologically what they're doing? Fred [Frederick A.] Horner was one who said, "Oh yes, he would!" Then others followed. What about the psychological tests? We need those. I think we actually got the developmental tests, the psychology tests, funded on a cost basis or something. So all of these people volunteered their time. Helen and Ruth [social workers] would make an appointment with this preemie, and as I said they were 10 years old at that time.

DR. NELSON: The preemie was 10 years old?

DR. LUBCHENCO: The preemie was 10 years old. They would take this preemie when, they could bring this baby in or this child in and he would go to all of these different people who tested him and, you know, spent a whole day. The social worker went right with them and saw that everything got done. I think we even had some pictures taken and stuff like that, that we had all done in one day. All volunteer. Maybe the psychologist was paid something, I'm not sure about that, even that might have been free. I think [in] one place we had EKG's included because Dave [David R. Siegel] Metcalf was interested in EKG [EEG?] development. So we had all these things done, and we got back most of the babies who had been born between 1947 and 1950, and that was the time of the RLF [retrolental fibroplasias]. When we found that two-thirds of our population under 1,500 grams—we did limit the size—had some kind of problem, that was pretty depressing. In spite of that, we said we are not going to excuse a preemie just because you don't expect as much of a preemie. [In] these tests that are done, compared to normal children, this child has problems. So we identified them all, and that was that first paper we wrote on the sequelae of prematurity. [Lubchenco LO, Delivoria-Papadopoulos M, Searls D. Long-term follow-up studies of prematurely born infants. II. Influence of birth weight and gestational age on sequelae. *The Journal of Pediatrics*. 1972;80:509-512]

Then the next 3 years we did, because that was the time we had reduced oxygen. And a lot of them had some residual from retrolental [fibroplasia]. That's how we got started. Then we began seeing children earlier and earlier, because it was my conviction that a lot of the things that they were [experiencing] had to do with nursery practices. I think we've shown that over and over again, that a lot of them had to do with our practices. I thought that the earlier we could evaluate them, the more likely we were to pick up nursery practices that were adverse, or caused adverse outcomes. In fact, I think we did. We began seeing them first at 4 years, and then at 2 years and then at 1 year, you know, so that we could get closer and closer to the nursery and what was going on in the nursery. See, I was well aware of what was going on in the nursery, because I was attending. So it wasn't as though I wasn't familiar with the technology. It was just that that wasn't what I liked. [laughs] I found so much else that was pretty challenging. But I knew what was going on, so I could tell what the changes had been in the nursery in terms of what the outcome was. Some of our later studies were really...one that was really exciting to me was when Watty [Watson] Bowes and Mike [Michael A.] Simmons... You know Watty Bowes is an OB, and Mike Simmons in neonatology was then in charge of the nursery. [They] decided that the care of this high-risk mother might be a clue. Our mortality under 1,500 grams [was] about 50%. It had been that way for years and years. It just hadn't changed. [With] what we had done, mortality had not changed. So Mike and Watty decided that they would attend the delivery of

every mother there at University [of Colorado] Hospital whose fetus was estimated at 1,500 grams or less. They did that for over a year, and the mortality dropped from 50 to 25%. Now that was absolutely fantastic. "What did they do?" people asked. "What did they do that was different?" Their presence, first of all, made it [so] that child was important. That fetus was not something that you just gave up. They also found out that obstetricians overestimated the weights in that range, and they were often faced with a premie that was smaller than they had expected. Then they gave immediate resuscitation. That early stabilization was very important in the survival as well as ... Now the outcome wasn't any different from the year before. But the number that were saved were twice as many. So that they were not increasing the incidence of handicaps by this, but they were not decreasing the incidence, either. That was an exciting one. Then I think the one we did with Joe Butterfield was... I don't think it could ever be done again. But we did it city-wide, and we compared delivery in the University [of Colorado] Hospital with Level 1 hospitals. I think there were 4 or 5 hospitals, [and we did this] before they had even gotten Level 2 nurseries. That was also very important.

DR. NELSON: The other thing I wanted to ask was, what about the economics of all this?

DR. LUBCHENCO: You know, you're asking me questions that I'm not good at.

DR. NELSON: Well, Joe had said some of that too. That's perfectly all right, because things that change economics, we have not much control over.

DR. LUBCHENCO: I am really very equivocal about this, because the smaller you save them, the longer the hospitalization is going to be. Yet, of course, still the primary focus on OB should be the prevention, if that can be done.

DR. NELSON: Can you identify any other[s] in this area? You talked about Watty Bowes, Mike Simmons. Off the top of your head, do you remember people in other areas who were contributing a great deal when you entered? You talked about the surfactant study... Lou [Louis] Gluck and Mary Ellen Avery. You talked about [how] feeding was really questionable, how effective some of the feeding was that we were doing. Can you think of anybody else to stand out that really... Clement Smith, some of his studies?

DR. LUBCHENCO: That was so far back, wasn't it? [laughs] But he started it, you know, I mean Clement Smith was known for newborn care long before anybody else was.

DR. NELSON: Did you pay much attention to [Victoria] Mary Crosse's work when she finally said...

DR. LUBCHENCO: Oh yes, I really did. Especially...she thought about oxygen long before other people did.

DR. NELSON: Of course, she pointed out that not feeding babies was not a good plan.

DR. LUBCHENCO: Well I believed that right from the beginning. The more I could read or the more I could see is that somehow we needed to get nutrition into these babies—and immediately.

DR. NELSON: You see, in that goal we don't differ from [Pierre] Budin earlier saying there should be a special effort to furnish nutrition. Now, they couldn't furnish nutrition the way we do today.

DR. LUBCHENCO: And I still am a great advocate of breast milk and breastfeeding, especially.

DR. NELSON: Well remember [there was a time you] died if you didn't have breast milk. You had no way of really...

DR. LUBCHENCO: That's right. But the more you know about breast milk the more you realize that it's vital for the human baby. I mean it's got things that nothing else has got in it that the baby needs to survive. I guess even premie milk is more specifically suited than later. But these are the kind of things that I really got embroiled with, especially to try to increase breastfeeding...and to decrease circumcisions. [laughs]

DR. NELSON: Well, how do you feel about some of the ethical issues of pediatrics?

DR. LUBCHENCO: I think they're very important and the hardest thing we're dealing with right now. First of all people ask, "How small is too small?"

DR. NELSON: I wanted to ask that.

DR. LUBCHENCO: I'd like to answer that, but it'll be a roundabout way of answering it. It seem like I've done that all morning. When I was preparing this talk for Paris, I was going over survival birthweight and outcome. I am convinced—and I think all the rest of the data would point this out—that you improve survival because of some new technique or some new medication or *something* new that comes along. Mortality doesn't go down like this [gradual decline]. Mortality goes down like this [steep drops]. If you are

aware of what's happening, you can identify what it is that you've done. I could do that in the Colorado data quite well, because I kind of knew what was going on. So I was looking at what kinds of things have gone on to [decrease] mortality. Then look at what's happened to the babies that you follow up. Now that first one [study] with Mike [Simmons] and Watty Bowes was a good example. They instituted intensive delivery room care, and the mortality went down. Well, now we've got more babies—smaller babies—but the incidence of handicaps, if you take the tiny ones, remains about the same. In the tiniest segment, even starting with Hess' [data], he took the ones under 1,000 grams who weren't even supposed to be viable, and he had them...

DR. NELSON: Yes.

DR. LUBCHENCO: Then he looked at them in the follow-up and about half of them have some kind of significant problem. I've done that with our data. I've looked especially at the data from Canada and Australia, because we don't have the same kind of data here. We don't have the follow-up. We can't get it.

DR. NELSON: Yes, they have some very...

DR. LUBCHENCO: Well they've got a national health service, and that allows them to get all their babies back in. That we just can't do. No matter how hard Ed Goldson and I tried to get this one group back in, there were a lot of babies we couldn't find. Even the ones we could find wouldn't come in. So I was using their [Canadian and Australian] data mostly, and Hess' data. Hess' data was [from] back in the 1920s. So his under 1,000 grams, about 50%. Then I'd take a look at these smaller ones, let's say after [surfactant]. There's a lot of ones that got smaller, but the handicap rate is about 50%. And if you get down to 600 grams, you look at that, and it's still about that. So my concept is that I don't know what the lower limit will ever be. It really depends on research and science to see how low you're going to go. Because we used to think they couldn't survive under 1,000 grams, and now look where they're surviving. Or the gestation was such.... I don't know, it may go a lot lower. But I really have this feeling that when you finally get that lower segment, you're going to find that those survivors that didn't survive before, like under 600 grams, you're going to have about 50% handicapped. So that's my concept of what's going on in technology and outcome. As long as 50% of the children who survive are normal, you aren't ever going to have a lower limit. I mean, you would say, "They're worth saving if half of them are normal." I mean, you think about that dilemma for a while.

DR. NELSON: I've been thinking about the way they look forward [in time] to mortality in large babies. You know, as they get bigger and bigger and bigger, we say, "Well, how many of these will survive?" As you look forward in

certain periods of time [and] you look all the way back, now you're looking the same way but you come from the other direction.

DR. LUBCHENCO: Yes. That's my concept of what's going on. That is the dilemma. Here you've got a mother, let's say 26 weeks, and what is going to be the outcome of this baby if it survives? You can say you've got a 50/50 chance of the baby either being severely handicapped or being normal. When I say 'normal,' I really need to qualify this a little bit. Because I think no matter when you test a preemie over a full-term baby, there are things that don't measure up. But they fall within the normal spectrum, so that they might have had an IQ of 120 and now they may have a 90, or 100. So that...

END OF TAPE THREE

DR. NELSON: We were talking about the charts that you derived from a whole number of observations, and [then] got to what we call restricted growth babies—or small for gestational age—and how they differed from other babies.

DR. LUBCHENCO: Yes, and we touched on the fact that in our premature center, as it was called then, we were limited by weight in terms of babies that could be admitted to the nursery. Since I was working more in the term nursery and had a lot of sick babies, I realized that we had babies well over 2,500 grams who were premature and needed to be in the nursery. And we had this whole group of babies who were small for gestational age at term. I think I mentioned, too, that Joe Butterfield was very much aware of this. So when he went to Children's Hospital he had a newborn center, not a premature center. I almost envied him the ability to organize that.

DR. NELSON: He went over there when? [In] 1967?

DR. LUBCHENCO: Gee, I can't remember.

DR. NELSON: But you felt that was a better way of approaching things?

DR. LUBCHENCO: Oh yes, and I think we may have even talked about or fussed about the limit of 2,500 grams. To follow up on this, we were particularly impressed with term babies who were small, and that they really didn't need that kind of care. But they had a lot of problems. It wasn't as though just because they were term they didn't have any problems. So, again, talking with Edith Boyd in the Child Research Council... We were going to a meeting, I think it was an SPR meeting. We made an appointment ahead of time with Ethel Dunham, who was at the Children's Bureau, to talk about this limit of 2,500 grams and having it called premature babies. So we had a meeting with her, I think we had a luncheon meeting. She was very understanding, and I think it was probably at that time she would be willing

to call it low birth weight. But her impression of this was she said, "Yes I'm sure that happens. But if you look at all of the data, 2,500 grams is a very good cutoff in terms of morbidity and mortality." She still thought 2,500 grams was very important to keep, and not exclude that and use gestational age alone. I think it was out of that, then, they began to call it low birth weight instead of prematures, [those who] were under 2,500 grams. So we tried. We didn't always get to first base, but...

DR. NELSON: Do you think it was better received [there] than it was in Denver?

DR. LUBCHENCO: No, I don't ever remember... You know that 2,500 gram thing was more academic. I don't think it ever bothered the practicing pediatricians as much as it did, maybe, the people in the university. But it was Fred [Frederick C.] Battaglia who said we really need to get this out. It was being discussed in the Committee on Fetus and Newborn [of the American Academy of Pediatrics]. I thought just publishing it was enough but Fred was the one who said, "No, what we need to do is submit a paper talking just about the classification of babies and what this could mean." So we did. [Battaglia FC, Lubchenco LO. A practical classification of newborn infants by weight and gestational age. *The Journal of Pediatrics* 1967. (71);2:159-163].

We wrote this up, and it was published. I think that also was helpful in terms of getting it out to the public, because then we talked about the small for gestational age, and we also talked about the babies that were large for gestational age. In fact, I made a chart once at Fred's suggestion of the kind of morbidities that you would see at each birth weight/gestational age position. Those were the things then that really came about. So when it was discussed, I think, for the second time in the Committee on Fetus and Newborn, it was Bill Silverman who said we need some kind of classification that includes birth weight and gestational age.

DR. NELSON: You know we had earlier used a classification called post-mature babies, talking about maturity. Stewart [H.] Clifford was writing some papers on that. [Clifford, SH. Post maturity. *Transactions of the New England Obstetrical and Gynecological Society*. 1957;11:105-14]

DR. LUBCHENCO: Yes. Well, that's part of it. I mean, we didn't exclude post-term. Post-term babies were very much at risk. I believe that there is a real problem with post-term babies.

DR. NELSON: Those are some of the things I am particularly interested in.

DR. LUBCHENCO: Some of these babies we saw, they were the ones who were small for gestational age. If they were early in pre-term delivery, and this had been going on a long while, you could see weight, length and head

circumference decreased. But a lot of these term babies looked as though they had had an acute loss of weight. They were long and thin and almost wrinkled. They looked like they had just lost a lot of weight. And their head circumference and their length was good. I kept thinking that, depending on where they stood in weight, length, and head, that you could sort of predict the kind of growth... Because these babies that were all long and their head circumferences were good and they just lost weight, they just quickly caught up and were just as perfectly normal.

DR. NELSON: I know you used asymmetry at the time...

DR. LUBCHENCO: Yes. That was another reason in that first paper we made a weight/length ratio, which was following... I don't know whether [John W.] Scanlon thought it up or Edith Boyd thought it up, but using length and then making a volume out of it by cubing it. So we published that chart as well.

DR. NELSON: I think she used the term ponderal indices, or was it Herb [Herbert C.] Miller or somebody?

DR. LUBCHENCO: Yes, ponderal. I think that's what Herb Miller used.

DR. NELSON: He really developed a lot of his work around diabetic babies, and so he saw some...

DR. LUBCHENCO: Some of those, yes. But these tiny babies who were maybe, for a long time and very early, retarded...they were symmetrical, but they were small in head, length, and weight. They tended to remain small, and we see those today. Some of them were picked up thinking they were failure to thrive. But I think that's just the way they're going to grow because they were the runt in the litter.

DR. NELSON: You want to look at runt babies, so to speak like that. When you have global influences on growth, what do you think it does to the brain?

DR. LUBCHENCO: I think it must have some effect, and I think Maureen Hack has showed that if their heads didn't grow by 8 months, if they didn't come back, that they didn't develop as well.

DR. NELSON: When you measure more of the functional things in babies, and some of the things that [Stella] Chess talked about...the way a baby acts. Do you think that [a baby's emotional development] plays any part?

DR. LUBCHENCO: I just think what Brazelton has shown us is that babies are so different. I don't know what may make [them different]...maybe

some of them have neurologic damage. But I think the infant's behavior is vital in terms of the mother-infant interaction. If the mother doesn't understand this and thinks it's all her fault, or that the baby's just a fussy baby, it can make a lot of difference in how they raise that child.

DR. NELSON: You know, you were in a very busy time. Now I want to talk a little bit [about] how your career sort of slowed down. [When] did you actually retire? How was that handled within the practice and things?

DR. LUBCHENCO: Well I'll answer that, but I need to come back to this other some time. I was lucky in many ways. But I retired really before I wanted to. It was very hard for me to do this because I was 62.

DR. NELSON: That's an early retirement.

DR. LUBCHENCO: It was. It was real early. I had grants that were funded for the next 2 or 3 years, but it was financially better for me to retire than to go part time. Because if I went part time, then my ultimate retirement pay would be depending on those last 2 or 3 years. The reason I did that was that Joe was older than I, and he was not in very good health. He was about to retire. I think [he was] 70 at that point. Or close to it anyway. That was really why I did this. It was not, particularly, that I wanted very much to quit. So I was still busy, I would say about half time, with the follow-up grants that we had. In fact, I kept on doing that even after the funds ran out. [laughs] Ginny [Virginia Delaney-]Black and I were following a group of babies with polycythemia and we ran out of money. So we both learned how to do the Bayley [Scales of Infant Development]. We did the whole thing ourselves, you know. So I kept on being busy. But I still had time to be with Joe and we could go places and enjoy his retirement for 2 or 3 years...[that] was all we really had. After that I really missed it and said, "Isn't there something I can do over here on a volunteer basis?"

DR. NELSON: Now you bring up Ginny Black. I know there are some other people [like] Joe Butterfield, he's one of your protégés. And Ginny Black wrote quite a bit on polycythemia, as I recall.

DR. LUBCHENCO: Well that's why I said I really want to talk a little bit more about this kind of thing, and how these studies...

DR. NELSON: How it came about.

DR. LUBCHENCO: Yes, let me tell you how it came about. It still goes back to the SGA babies, you know, you get so puzzled about it. So we had followed these babies and we realized that a lot of them did not do that well developmentally. They had all kind of different things [that] not have been tremendously serious, but they were not normal. I figured, well, maybe it's

the hypoglycemia, because that seems to be the common denominator of intrauterine growth retardation. These babies are born and then they don't have much in the way of carbohydrates to call on. So the whole carbohydrate metabolism became of quite a lot of interest to me. Then we began systematically following the SGAs, with and without hypoglycemia.

DR. NELSON: Did you use [Marvin] Cornblath's definitions?

DR. LUBCHENCO: No, I didn't. I thought Cornblath's definitions were too liberal, because I just could not believe that a glucose of... Well, and he had 2 standards. He had one for preemies and one for term babies. Was it 20 milligrams percent? Or 30 milligrams? I thought, "You know, I don't think that's very good for a baby, whether it's 20 or 30 or maybe [even] 40." I guess we chose 20, so that if there was a difference in outcome we would be able to see it. So we had 20 versus normal. There was no difference. The hypoglycemia didn't seem to be the factor that made a difference in the outcome. And it was puzzling over this that we also began realizing... By that time I had a little lab of my own. You know, the plan had been that Donough O'Brien would set up the microchemistry lab and they would do the lab part and we would do the other. But that doesn't work that way. I finally convinced somebody I needed this, even if we didn't do anything but glucoses. We could do them on the ones we wanted, and when we wanted. And there were a lot of timed...we had to time these. I think we use[d] that [sample taken] before the first feeding, which was 3 or 4 hours.

PAUSE IN TAPE; PHONE RINGS

DR. LUBCHENCO: There was no difference in the outcome. But we realized that [in] a lot of these babies it was real hard to do these chemistries because they had such a high hematocrit. That is when we thought... Then we began looking up the literature on polycythemia. That got us into things that are still not solved. I wish, someday, that we will get a handle on this. I personally think it's much more serious than people do today. I think they've shrugged it off because they don't know what to do.

DR. NELSON: Last night I brought up the subject to one of your colleagues, saying that one of the great things that he, as a hematologist, could do is figure out a very simple way about which we could look at cell size and by volume. He said, "They won't let us use chromium." [laughs] I said, "All right, all right."

DR. LUBCHENCO: Yes. [laughs] But that's how we got into polycythemia.

DR. NELSON: Now I know Jack [H.] Githens was pretty close to you. What did Jack say when you talked to him about polycythemia?

DR. LUBCHENCO: Well, Jack was interested, but I tell you Bill [William E.] Hathaway was even more interested. By the time we really got into this, Jack and Bill had kind of separated hematology into the clotting and into the clinical... Jack was more interested in the [tape interruption] cell and all these other things, so Jack took that on. Bill Hathaway feels even more strongly than I do that this is a serious thing.

DR. NELSON: Well, didn't Hathaway publish something about increased instance of thromboembolism and things in these children?

DR. LUBCHENCO: I think so, yes [Barnard DR, Hathaway WE. Neonatal Thrombosis. *[The American Journal of Pediatric Hematology/Oncology.* 1979;1(3):235-244]. Everything that you read tells you that it's not good for a baby to be polycythemic at birth. Every organ is affected, if you look at it. I think [in] the first 20 that we studied, we had x-rays of the lungs and I think 17 out of the 20 had what we called 'wet lungs.' That was published by radiology. In that same group, we found red cells in the urine. We found some of them actually had cardiac problems. There's a whole group in the literature that were thought to be [affected by] cyanotic heart disease, and they turned out to be just polycythemic. They were perfectly normal hearts once they got... The reason I'm still convinced that we need to do something about this is that we followed the polycythemics. Then we got—well, we had both glucose *and* red cells, or hematocrits—and about a third of these babies have neurologic problems. Now I think that the rest of the organs seem to compensate all right, once either you reduce it or the baby reduces the hematocrit. Then these other organs seem to rebound all right and turn out all right except the brain.

DR. NELSON: Well, I know this was occurring in the beginning, [and] it sort of drifted into the time when we began doing fetal monitoring. If the baby did get in trouble, a number of [families] would end up in a court of law and the arguments began to be really hot and heavy then about causality.

DR. LUBCHENCO: Yes. Well, it was Fred [Frederick H.] Wirth, he was a fellow, and Karen [E.] Goldberg, who did the psychological tests. She did the Bayleys [Scales of Infant Development] on these.

DR. NELSON: I was going to ask what her role was, I guess because the names always fell in there together, you know. I'd look at all the bibliographies [and] here was this common cluster of people.

DR. LUBCHENCO: Yes. Fred and Karen really did a first study. It was a well-organized, prospective [study involving] randomly assigned cases. He was doing a beautiful job. He had about 10 patients in each of the 3 categories, which would be normals, polycythemia alone, and polycythemia with partial plasma exchange transfusion. When we followed these babies up

at 8 months, [Mary Anne] Guggenheim actually saw this small group. Out of that, at 8 months of age, there were 4 out of the 20—because there were 10 not exchanged and 10 exchanged—so there were 4 out of the 20 that had upper limb paresis. This, to me was impressive. You could see this little child doing this [motions] and this arm was not paralyzed, but it was just obviously not functioning as well. You can't see all of these things and think this is pretty benign. Even though you can't prove it. I think the treatment is still pretty much in the air. But anyway, after that first one [study] and Fred left, Ginny Black came. And Ginny really did a huge, beautiful study, It took her 2 years I think just to be sure she got the whole population. I think there must have been, oh, 70. It's a huge [group] of polycythemics, and they were matched with a normal...

DR. NELSON: Was Goldberg doing the evaluations?

DR. LUBCHENCO: I think by that time she left, too. We had someone else doing them. She may have done some of them, of Brazeltons, so that we had some evidence of the behavior. Well, maybe we didn't have it after Karen left. We didn't have the Brazeltons, but we had... All of this was done within the first few hours of life. Anyway, Ginny did a beautiful job of collecting that, the sample.

DR. NELSON: There were disturbances of cognitive function in these kinds of babies.

DR. LUBCHENCO: You know, that was not as prominent as the neurologic. Whether or not they were subtle enough that we couldn't pick it up, but we really couldn't get... There was a little difference in Fred's first study, in the Balleys. I think it was just short of being significant. But that was such a small group. But the neurologic findings which were... I saw a lot of these kids myself at [age] 2, because Ginny went to Detroit and I was trying to keep the population together for a 2-year-old exam. We saw them at 1 year and then again at 2. The ones at 1 year who had some neurologic problems, you could still pick it up at 2. They were mostly like increased reflexes in ankle clonus. Clumsy! They were the clumsiest kids you ever saw. Even the parents would say, "They're gonna trip over themselves."

DR. NELSON: There were functional differences.

DR. LUBCHENCO: There was a cluster of neurologic things that really fit. They were not, they were not earthshaking, they weren't that serious, but they were there. And...

DR. NELSON: I know some people talk about quality of function. The function is there, but it's of poor quality.

DR. LUBCHENCO: I wish we could measure that.

DR. NELSON: [laughs] Oh, you can't tell. When you say, "How do you measure that," I don't know.

DR. LUBCHENCO: Yes, but that's true. Maybe that's what I'm reacting to. Seeing these kids you get a different feel. Well, the data came out. The neurologic findings are there. Subtle or mild, but they're there. We can't demonstrate a difference between exchange and non-exchange. Even though I really believe that babies oughtn't to be polycythemic. Then we never knew, did this occur in-utero or was it just a post-natal adaptation. We couldn't document that. So the critics had plenty of reason to say this was an inconclusive study.

DR. NELSON: If you're hooked to a heart and lung apparatus, and you have something serious happening inside [and] your body responds, it's very difficult to go back and say what happened.

DR. LUBCHENCO: Yes.

DR. NELSON: I hate to act like an agent provocateur but...

DR. LUBCHENCO: Oh no, it's true.

DR. NELSON: I'm just trying to bring out...

DR. LUBCHENCO: There's something there. There's some relationship to polycythemia and hypoglycemia. The two together, they were the worst.

DR. NELSON: They were the worst.

DR. LUBCHENCO: Yes. So there's something there. When it occurs and how to treat it, I have often thought that what we need to do is blood-letting. Right at birth, as soon as you recognize it. But now they're not even doing hematocrits. We were doing them routinely, and that was a recommendation from the Academy [American Academy of Pediatrics].

DR. NELSON: Well, now that you bring that up, we're going to challenge the Academy here a little bit. What could you do with the general population of all newborns, when you see occasion like that. Does it merit our doing extra things?

DR. LUBCHENCO: Obviously I believe it does. Because there's so many things that happen later that we can't explain based on the newborn or in the delivery room or something, that I'm not at all sure has anything to do...

DR. NELSON: Because the bean counters you deal with today want to know should we do that or not.

DR. LUBCHENCO: Well I thought that it was very helpful to do a glucose and a hematocrit on these babies as a routine. I don't think either one is being done now.

DR. NELSON: No. What did your colleagues in obstetrics think about all of this activity? Some of them can get very nervous when we start looking very closely at the baby. They say you look closely, things are found, and we found ourselves being challenged on how we took care of the mother. Was there any effort to try to look back on those things at that time?

DR. LUBCHENCO: We've always worked pretty well with obstetrics. I think there was a period, even now, that it's not quite as close as it used to be. But there's enough overlap and enough working together, where we know the patients ahead of time. I say "we." Whatever faculty is involved is really almost a part of OB and their rounds and who is in the nursery and in the delivery room. So, I think that has not been such a problem, because you've already got input and, to the best of your ability, you handle the mother and the baby accordingly. So, I don't think there's been a finger-pointing kind of thing. I think it's trying to figure out honestly what is going on with this baby.

DR. NELSON: You didn't do any placental studies at that time?

DR. LUBCHENCO: No. I did some retrospective studies on placental weight and babies. There is certainly a very close relationship to placental weight and the weight of the babies. But I think that is a wide-open avenue for research, and there are people who are really looking at placentas.

DR. NELSON: Well I know some of us had suggested that people do save the placentas and do...

DR. LUBCHENCO: [garbled]

DR. NELSON: ...ultrasound on them, and to do soft x-ray techniques much like they do for mammography. But [that idea] never got off the ground.

DR. LUBCHENCO: Well, you know, it's money. That's why they're not screening babies for glucose and hematocrit. This whole thing they talk about [is being] cost-effective, and I'm afraid it's hard to show exactly what some of these things mean. Well, I wanted to get in the hypoglycemia and the polycythemia before I let you go. Without being able to show definitively that there was an effect on using partial plasma exchange... I did want to mention, one of the things that Ginny showed is that we probably chose the

wrong material to do partial plasma exchange. We used fresh frozen plasma, and that's got enough clotting factors in it that we actually made them worse. I mean, so the babies who got the partial plasma exchanges, some of them got symptoms that I think were related to that. We were real concerned about NEC [necrotizing enterocolitis], and you could find some evidence of that in those babies.

DR. NELSON: What would you have suggested if you had to go back and do it again? That's a hard thing to say isn't it?

DR. LUBCHENCO: Yeah, but I think we would not use, I don't know what we would use now, but we'd...

DR. NELSON: Just plain albumin and saline?

DR. LUBCHENCO: Probably, yes. We thought about probably that, albumin and saline—something isotonic I guess. Again, that's where I keep thinking [about] just removing the blood, and then the baby very quickly dilutes it. You know, to me it has such an appeal. The reason they didn't do this, or nobody would go ahead and do it, is that they'd say, "Well, if you remove that much blood volume, are they going to go into shock or something like that." We used to do pressure by just holding the tube in the umbilical vein you know, up and...

DR. NELSON: See what, they had central [garbled], determination, we had one trap though you had to be sure that [garbled].

DR. LUBCHENCO: That's right you sure did. That's why I think they're afraid just to remove an amount of blood. But it seems like such a safe thing to do. Actually what happened is that some of these babies that they knew were—this was after the study, they just drew a lot of blood for the lab tests, you know. [laughs]

DR. NELSON: Did you ever see a bleeding basin?

DR. LUBCHENCO: No.

DR. NELSON: Well it looks like an alms basin and has just a cut-out, what was put against the arm. I saw them in England at one of our history of medicine meetings.

DR. LUBCHENCO: We didn't have any leeches. [laughs]

DR. NELSON: [laughs] Well you know, leeches have... Dr. [Hathaway] probably would comment on this more, he said heparin was probably going to go out and lepirudin, the product of the leech.

DR. LUBCHENCO: Oh you were mentioning that there's a better thing.

DR. NELSON: It's up in Canada. I have not seen any commercial products coming out with lepirudin yet, but I know they are going to market them.

DR. LUBCHENCO: Well, those are stories. One other thing that we did... I say "we" – mostly my fellows and I was kind of cheering them on or thinking this is a great idea. But Peggy [Margaret] Markarian was one of my fellows. She was interested in heparin and the use of this in respiratory distress. And the literature, all the data—both basic literature and others—really looked very good. We weren't going to have enough patients over a couple of years even to do this. We had this visiting doctor, who was a WHO [World Health Organization] fellow visiting our place from Chile, and she says, "My gosh, if you need babies, we've got a baby factory." [laughs] They had 10,000 or 12,000 deliveries a year in this hospital [in Chile], and she had established a remarkably good premature nursery. So anyway, we ended up going down there, and Jack Githens was the one who really helped us get funded for this, and it was almost a year study down there.

DR. NELSON: What were they primarily looking at, blood counts?

DR. LUBCHENCO: It was mostly survival and outcome.

DR. NELSON: Survival and outcome.

DR. LUBCHENCO: They did a lot of the blood testing at the time, and the clotting mechanism. But they were using heparin and 10 years later, 15 years later...

DR. NELSON: That's what they were using in Chile, they were using heparin?

DR. LUBCHENCO: Yes. Ten or 15 years later, Marilyn Manco-Johnson came out with [a study] showing what happened. We didn't use a large enough dose. Of course we had no idea what the right dose was, either.

DR. NELSON: Well you know the body likes to keep blood very liquid, but you have to fight all the time to keep it liquid.

DR. LUBCHENCO: Well anyway, I thought that was just done too early, just too soon. [laughs] There were all kind of things that, if you're clinically oriented and you have a little curiosity, there's just no end to what you want...

DR. NELSON: The problem [is] you didn't have an enzyme involved. You see, you could have sold somebody a bill of goods. Like people, brought up last night—how do you feel about doctors having a background in art and literature to avoid being made a sucker?

DR. LUBCHENCO: [laughs]

DR. NELSON: Do you think we ought to insist that students have a little more art and a little bit more literature so that they think properly and they view things aesthetically? Because usually if things are not aesthetic, [they are] often [based on] a bad reasoning process.

DR. LUBCHENCO: I think a good general background in all of those things is wonderful. I think they're getting it because they're older as they come into medical school now. And they've had a chance to do a lot more than some of us who went right into medicine.

DR. NELSON: Well, now I'm getting into the subject that I've been a little reluctant to talk about. Do you think that the bright young ladies who are coming in are making a difference? I know that young ladies weren't as welcome, at least in my time, in medical school.

DR. LUBCHENCO: I was delighted when more young women came in. I think the one thing that has been shown, you know, there really are some differences in the way women approach medicine than men, and I think it has been shown they take a little more time with their patients.

DR. NELSON: Do you think they have more [a] prismatic view [rather] than a hierarchical view of things? That is, one thing more important than the other thing and more important... Because, in general, scientists tend to look at hierarchy. Variation, to us, is a very important thing and we rate these things [as to] which is the more important, versus prismatic [thinking], where you look at everything.

DR. LUBCHENCO: I guess I have to say there's probably more variation between women than there is between men and women. I've seen wonderful basic scientists and I have seen wonderful clinicians, and I think there's all in between. I think that those who have a family have to make some pretty serious choices in terms of whether they can do both or how they work or how they juggle...

DR. NELSON: Do you think, then, that women with families shouldn't do basic science?

DR. LUBCHENCO: I couldn't possibly say that! [laughs] Not with a clear conscience.

DR. NELSON: I'm the devil's advocate. I would sort of like to know what is actually going on.

DR. LUBCHENCO: Why in the world I would do this and have a family and all of this... You don't go through medicine and not use it. It's inconceivable to me that if you had all of this training and not use it's unconscionable I guess I would say.

DR. NELSON: When you've been on admitting committees—now you were on one—and the state looked very dimly on bringing somebody in training to be a physician and then they not carry out their practice. Because, I don't know what it costs in Colorado to train a physician...

DR. LUBCHENCO: My approach is if you have that kind of drive to learn all this sort of stuff, it just doesn't stop. You feel like you [need to] keep on. I went through the residencies and, you know, as part of a year practice and fellowship and then I was ready to take my boards and I took them at the right time. But when Joe had this possibility to go work with Paul White, I really looked forward to that year off. Because I thought maybe I was missing something. I had a 1-year old, and I was having, I guess, a lot of guilt and stuff. But I wanted to be with her, and I really looked forward to this year. So we went to Boston and we had a nice duplex where we stayed, and Joe was at Massachusetts General. I went one day a week to Children's Hospital [Boston], their conferences and rounds and all this sort of stuff. By the end of that year I was miserable. I wasn't a good mother and I wasn't a good wife. I wasn't good for myself. That experience said you know, I have to work. I don't care what it is. I need to use what I know. So, after that, there was really no question in my mind. It was just a matter of finding a good job and keeping it. In those days keeping a job and having a family was pretty rough, because there were, you know... I have to be very grateful to my chairmen for the fact that I could stay on. But I would have done probably anything and been very happy doing it, because I liked the people, I liked medicine, [and] I liked research. So that's an inward drive. Yet I think there was no doubt in anybody's mind that if there came a choice between the family and the work, I would choose family and do whatever I needed to do there.

DR. NELSON: Why was the old boys' club so slow to come around?

DR. LUBCHENCO: I think it's a threat. Don't you?

DR. NELSON: Well, yes, now you brought the word up. Some of the young women were a real threat to some of them, yes.

DR. LUBCHENCO: Some of them are very, very bright and very dedicated. And...

DR. NELSON: Yes. For instance, at New Haven there was no place for women to stay actually in the quarters. It was a male-dominated quarter like that. It was looked askance at... We didn't even have a mixed area where male and female doctors would mix that way, to live.

DR. LUBCHENCO: Well, you know, Colorado General had women's quarters. They weren't very elaborate, but neither were the men's I guess. But it was right there on the ward. When I went to Rochester, there was a wing that was a women's wing. There were only 2 of us, [laughs], but we had a wing in the same building that the men had theirs in.

DR. NELSON: What about women progressing?

DR. LUBCHENCO: And what?

DR. NELSON: What about progressing of women through academic ranks? Do you think women made professorship later than other people?

DR. LUBCHENCO: Well I know I did. I have to speak for myself there. As I think I mentioned to you, when I decided I needed to work it didn't matter as long as they let me work. I really was not that ambitious, I guess is the word I'm looking for. I think a lot of good things happened that I was not really working toward, but I was just doing the things that were interesting and there were curiosities that needed to be done. I think that was more the way I felt. I have a hard time...

END OF TAPE FOUR

Index

A

Alacta, 21, 23
Als, Heidelise, 35
Alway, Robert Hamilton, 22, 23
American Academy of Pediatrics, 27, 28, 44, 50
American Academy of Pediatrics, Committee on Fetus and Newborn, 28, 44
American Academy of Pediatrics, Section on Perinatal Pediatrics, 28
Avery, Mary Ellen, 40

B

Battaglia, Frederick C., 44
Bayley Scales of Infant Development, 46, 48
Bowes, Watson, 39, 40, 42
Boyd, Edith, 24, 25, 26, 27, 43, 45
Brazelton, T. Berry, 35, 45
Brazie, Joseph V., 32, 33
Butterfield, L. Joseph, 23, 30, 32, 34, 36, 40, 43, 46
Butterfield, Perry M., 35

C

Calkins, Leroy A., 24
Campbell, Winona G., 14
Child Research Council of Denver, 5, 24, 25, 43
Children's Hospital Boston, 10, 55
Children's Hospital Colorado, 7, 8, 9, 10, 11, 32
Clausen, Samuel L., 7, 29
Clifford, Stewart H., 44
Colorado General Hospital, 5, 56
Cornblath, Marvin, 47
Cushman, Oca, 8

D

Dancis, Joseph, 24
Danielson, Wayne H., 10
Day, Richard L., 22
Delaney-Black, Virginia, 46, 49, 51
Denver University, 3, 4, 8
Desmond, Murdina, 30
Dunham, Ethel Collins, 13, 43

F

Fisher, G. Robert, 12
Forbes, Roy P., 8

G

Githens, Jack H., 47, 53
Gluck, Louis, 40
Goldberg, Karen E., 48, 49
Goldson, Edward, 36, 42
Gordon Armstrong incubator, 19, 22
Gordon, Harry, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 27, 29, 31, 32, 38
Guggenheim, Mary Anne, 49

H

Hack, Maureen, 45
Hansman, Charlotte F., 25, 27
Hathaway, William E., 48, 52
Haxtun, Colorado, 2, 3
Hess, Julius, 38, 42
Hix, Ivan E. Jr., 21, 22, 38
Horner, Frederick A., 38
Horton, Frank H., 16

J

Jackson, Edith Banfield, 32, 33
Josephson, Carl J., 6, 7, 11, 15, 46, 55

K

Kempe, C. Henry, 30, 31, 32, 33
Kerensky, Aledsandr Fyodorovich, 2
Kinsey, V. Everett, 20, 21, 22, 38
Klaus, Marshall H., 35

L

Levine, Samuel A., 11
Lewis, Robert C., 13

M

Manco-Johnson, Marilyn, 53
Maresh, Marion M., 24
Markarian, Margaret, 53
Mead Johnson, 10
Medical College of North Carolina, 1
Metcalf, David R. Siegel, 39

Miller, Herbert C., 45
Muggeridge, Ed, 7

O

O'Brien, Donough, 23, 30, 31, 32, 47
Oleum Percomorphum, 22
Owens, Ella Uhler, 20
Owens, William Councilman, 20

P

Palmer, Harold D., 10, 11, 12, 27
Powers, Grover F., 18, 33
Premature and Newborn Center, 14

R

Reinhold, June, 33
retrolental fibroplasia, 18, 20, 21, 22, 23, 27,
28, 38, 39
Rochester, New York, 6, 9, 18, 29, 56
Rotch, Thomas, 16
Russia, 1, 2
Rutledge, Enid K., 5

S

Scammon, Richard E., 24
Scanlon, John W., 45
Schroeder, Patricia S., 34
Segal, Sydney, 31
Silver, Henry K., 33

Silverman, William A., 17, 28, 44
Simmons, Michael A., 39, 40, 42
Skinner, Cornelia Otis, 11
Smith, Clement Andrew, 23, 31, 40
Society for Pediatric Research, 28, 43
Strong Memorial Hospital, 6

T

Tammen Hall, 8
Taylor, E. Stewart, 12, 13, 38

U

University of Colorado, 4, 5, 10, 12, 13, 18
University of Colorado Hospital, 40
US Children's Bureau, 32, 43

V

Verploeg, Ralph H., 9

W

Washburn, Alfred H., 6, 9, 16, 24
White, Paul Dudley, 10, 11, 55
Wirth, Frederick H., 48, 49

Y

Ylppö, Arvo, 17