

CHEMICAL HERITAGE FOUNDATION

**CHARLES M. RUBIN**

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview  
Conducted by

Neil D. Hathaway

at

University of Chicago Medical Center  
Chicago, Illinois

on

5, 7, and 9 November 1992

From the Original Collection of the University of California, Los Angeles

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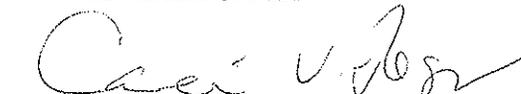
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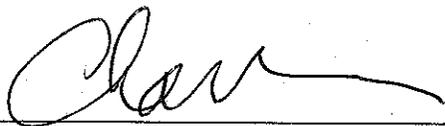
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## CHARLES M. RUBIN

1953 Born in Long Branch, New Jersey, on 10 February

### Education

1975 B.A., Biology, University of Pennsylvania  
1979 M.D., Tufts University School of Medicine

### Professional Experience

1982-1985 University of Minnesota  
Fellow in Pediatric Hematology/Oncology

1985-1987 University of Chicago  
Fellow in Cytogenetics and Molecular Biology of Leukemia

1987-present Assistant Professor of Pediatrics and Medicine, Pritzker School  
of Medicine

1987-present Member, Cancer Research Center

1986-1989 Children's Memorial Hospital, Chicago, Illinois  
Provisional Attending Pediatrician

1988-1989 Michael Reese Hospital, Chicago, Illinois  
Associate Attending Member

1988-present University of Chicago Hospitals  
Medical Staff, Wyler Children's Hospital

1989-present Assistant Director, Hematology/Oncology, Cytogenetics  
Laboratory

1991-present Co-Director, Joint Pediatric/Medical Cancer Risk Clinic

### Honors

1974 Phi Beta Kappa  
1975 Summa Cum Laude  
1978 Alpha Omega Alpha  
1987 Special fellow, Leukemia Society of American  
1987 Leukemia Research Foundation Award  
1988 Schweppe Foundation Career Development Award

Selected Publications

- Rubin, C.M. et al., 1985. Leukemia cutis treated with total skin irradiation. *Cancer*, 55:2649-52.
- Rubin, C.M. et al., 1985. The accelerated phase of Chediak-Higashi syndrome: An expression of the virus-associated hemophagocytic syndrome? *Cancer*, 56:524-30.
- Rubin, C.M. et al., 1985. Intraocular retinoblastoma group V: An analysis of prognostic factors. *Journal of Clinical Oncology*, 3:680-85.
- Rubin, C.M. et al., 1986. Bone marrow transplantation for children with acute leukemia and Down syndrome. *Pediatrics*, 78:688-91.
- Rubin, C.M. et al., 1986. Cytogenetic studies of long-term survivors of childhood acute lymphoblastic leukemia: A follow-up report. *Medical and Pediatric Oncology*, 14:295-99.
- Rubin, C.M. et al., 1987. Association of a chromosomal 3;21 translocation with the blast phase of chronic myelogenous leukemia. *Blood*, 70:1338-42.
- Rubin, C.M. et al., 1988. Heterogeneity of genomic fusion of BCR and ABL in Philadelphia chromosome-positive acute lymphoblastic leukemia. *Proceedings of the National Academy of Sciences USA*, 85:2795-99.
- Rubin, C.M. et al., 1988. A deletion/insertion polymorphism in the human BCR gene on chromosome 22. *Nucleic Acids Research*, 16:8741.
- Rubin, C.M. et al., 1990. A recurring chromosomal abnormality in therapy-related myelodysplastic syndrome and acute myeloid leukemia. *Blood*, 76: 2594-98.
- Rubin, C.M. et al., 1991. Impact of chromosome translocations on prognosis in childhood acute lymphoblastic leukemia. *Journal of Clinical Oncology*, 9:2183-92.
- Rubin, C.M. et al., 1991. Therapy-related myelodys-plastic syndrome and acute myeloid leukemia in children: Correlation between chromosomal abnormalities and prior treatment. *Blood*, 78: 2982-88.
- Rubin, C.M. et al., 1992. Chromosomal abnormalities in skin following total body or total lymphoid irradiation. *Genes, Chromosomes, and Cancer*, 4:141-45.

## ABSTRACT

**Charles M. Rubin** grew up in Deal, New Jersey, the second of four children. His father was a dentist, his mother a secretary; both are Conservative Jews. He attended public school, which he liked and in which he did well. He was especially interested in science and mathematics, enjoying problem-solving. Racial tensions and riots at his high school in Asbury Park, however, framed much of his high school experience.

Rubin entered the University of Pennsylvania for his undergraduate degree. He spent summers as a counselor at a camp for handicapped children; he continued to visit the children during the school year; and when he was in medical school, he worked in the camp infirmary. Inspired by Bertram Lubin's course in genetics, he decided to enter medicine. In his last year of college he was excited by C. Everett Koop's separation of Siamese twins at the Children's Hospital of Philadelphia. He studied chromosome abnormalities in the lab of William Mellman, conducting research on spina bifida; he found (and still finds) gratification in helping sick children. He was admitted to Tufts University School of Medicine, about which he discusses his medical school classes and his interest in academic medicine. He took electives at three different children's hospitals, learned the health needs of inner-city children, and decided to specialize in pediatric oncology.

Rubin did subspecialty training in pediatric hematology/oncology at the University of Minnesota. Studying cytogenetics with Diane C. Arthur increased his interest in research, and he began studying chromosome damage in recipients of chemotherapy and radiation; Rubin's study of retinoblastoma recurrence has since led to more aggressive treatment. Rubin accepted a fellowship at the University of Chicago to acquire more training in research; there he found a clinical focus in Janet D. Rowley's lab. He began conducting further research on chromosome abnormalities and studying large pieces of DNA with pulsed field gel electrophoresis.

Rubin ends the interview with a discussion of his marriage and family and the challenge of balancing family and career. He talks about how national treatment protocols are created; about how research affects clinical practice; and about his shift away from research toward practice. He explains his teaching responsibilities and his clinical duties and talks about how he started the Joint Pediatric/Medical Cancer Risk Clinic. He finishes with a discussion of the genetic component in cancer and the limits of gene therapy.

## UCLA INTERVIEW HISTORY

### INTERVIEWER:

Neil D. Hathaway, Interviewer, UCLA Oral History Program. B.A., English and History, Georgetown University; M.A. and C. Phil., History, UCLA.

### TIME AND SETTING OF INTERVIEW:

**Place:** Rubin's office, University of Chicago Medical Center.

**Dates, length of sessions:** November 5, 1992 (85 minutes); November 7, 1992 (84); November 9, 1992 (74).

**Total number of recorded hours:** 4.0

**Persons present during interview:** Rubin and Hathaway.

### CONDUCT OF INTERVIEW:

This interview is one in a series with Pew scholars in the biomedical sciences conducted by the UCLA Oral History Program in conjunction with the Pew Charitable Trusts's Pew Scholars in the Biomedical Sciences Oral History and Archives Project. The Project has been designed to document the backgrounds, education, and research of biomedical scientists awarded five-year Pew scholarships, from 1988 through 1992.

In preparing for this interview, Hathaway, in consultation with the director of the UCLA Oral History Program and three UCLA faculty project consultants, developed a topic outline to provide an overall interview framework. Hathaway then held a telephone preinterview conversation with Rubin to obtain extensive written background information (curriculum vitae, copies of published articles, etc.) and agree on a research and interviewing timetable. Hathaway further reviewed the documentation in Rubin's file at the Pew Scholars Program office in San Francisco, including his proposal application, letters of recommendation, and reviews by Pew Scholars Program national advisory committee members. For general background on the recent history of the biological sciences, Hathaway consulted such works as: J.D. Watson et al., *The Molecular Biology of the Gene*. 4th ed. 2 vols. Menlo Park, CA: Benjamin/Cummings, 1987; Lubert Stryer, *Biochemistry*. 3d ed. New York: W.H. Freeman, 1988; *Journal of the History of Biology*; and H.F. Judson, *The Eighth Day of Creation: Makers of the Revolution in Biology*. New York: Simon and Schuster, 1979.

The interview is organized chronologically, beginning with Rubin's childhood in Deal, New Jersey, and his undergraduate education at the University of Pennsylvania and continuing through his medical education at Tufts University School of Medicine and his research at the University of Minnesota and the University of Chicago. Major topics discussed include pediatric oncology, the role of heredity in cancer, chromosome abnormalities, and the effects of cancer treatments.

## ORIGINAL EDITING:

Steven J. Novak, editor, edited the interview. He checked the verbatim transcript of the interview against the original tape recordings, edited for punctuation, paragraphing, and spelling, and verified proper names. Words and phrases inserted by the editor have been bracketed.

Rubin reviewed the transcript. He verified proper names and made minor corrections.

Novak prepared the table of contents, biographical summary, and interview history.

Vimala Jayanti, editor, compiled the index.

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**INTERVIEWER:** Neil D. Hathaway  
**LOCATION:** University of Chicago Medical Center  
Chicago, Illinois  
**DATE:** 5 November 1992

**HATHAWAY:** Good afternoon. I'm speaking with Charles Rubin today. This is our first interview. As I say all the time--I'm going to have to come up with a new phrase, I suppose--we like to start with the easy questions at the beginning. I'll just ask you where and when you were born?

**RUBIN:** That's easy. I was born in Long Branch, New Jersey, on February 10, 1953.

**HATHAWAY:** Again, were you the first child? Did you have siblings?

**RUBIN:** I was the second. I was the second of four boys. Long Branch is actually just the location of the hospital. We actually, for my whole childhood, lived in the town of Deal, New Jersey, which is nearby.

**HATHAWAY:** And it's a beach town too, right?

**RUBIN:** Yeah, it's right on the New Jersey shore.

**HATHAWAY:** The central Jersey shore. Would you like to talk about you parents maybe and their backgrounds?

**RUBIN:** Sure. My parents both were basically New Jersey people. My mother [Byrnece Rothauser Rubin] grew up in Maplewood, New Jersey, which is a little bit more north, closer to New York City. My father [Benjamin Rubin] grew up in Newark, New Jersey. They came down to the Jersey shore at the time that my father opened up his first private dental practice. They decided to do that down on the Jersey shore. So they moved down there I think shortly after they got married.

**HATHAWAY:** Do you know a more specific time when that was? Right after the war [World War II]? Later?

**RUBIN:** Yeah, it was after the war. My brother [Michael D. Rubin] was born in '51, and they probably got married maybe a year or two before that. So they got married maybe '49 and moved down to the Jersey shore around then.

**HATHAWAY:** Why don't we get their names, including your mother?

**RUBIN:** My father is Benjamin Rubin. My mother's name is Byrnece. Rothauser was her maiden name.

**HATHAWAY:** You said your father had his first private dental practice. How was he practicing before?

**RUBIN:** He was in the army. He was a dentist in the army. I don't know that he did a lot of dental work, but he was given the rank. You know, he got a better rank based on the fact that he was a professional. He might have done some dental work in the army. I think for a very short time he was in with another dentist in the Newark area but then quickly decided to open his own practice of orthodontics, which was his specialty, on the Jersey shore.

**HATHAWAY:** Do you know much about your parents' upbringing and their families? Were there a lot of visits from relatives or you would go see relatives?

**RUBIN:** Yeah, we were pretty close with the grandparents. My father, like I said, grew up in Newark. They were poor. His father actually died when he was ten, so I never met my natural grandfather [Michael Rubin]. But we knew my grandmother on his side very well. Her name was Sonny; we called her Grandma Sonny. Her actual real name was Sonia [Rubin]. And she remarried. She married a guy who was for us like my grandfather, because my real grandfather died before I was born. We went to visit them. They lived in a small apartment in Newark. Going to visit them in Newark from the Jersey shore was like an hour drive.

**HATHAWAY:** Now it's two hours on the parkway, right, because of the traffic!

**RUBIN:** That was always really, really fun to go see them. We went to see them very often.

**HATHAWAY:** Weekend-type trips, day?

**RUBIN:** Yeah, as far as I know, it was usually on the weekend, just for the day. We never stayed there over-night. Maybe we did occasionally, but usually we'd just go for the day.

**HATHAWAY:** Do you remember why you found that so much fun or why you looked forward to going?

**RUBIN:** I know why. It's amazing how little things make kids really excited. They lived on what I think was the fourth floor of a walk-up apartment building. There are a whole lot of things about that building that we just thought were incredible. But thinking about it now, they were not only not incredible, they were just like the plainest, simplest, everyday little things that you could possibly imagine. Just walking up and down the stairs in the stairwell was incredible, hiding in the stairwells, playing hide-and-seek in the stairwells. All that kind of stuff, that alone. Having to be quiet in the stairwells because you knew that there were all these people that lived in the building too was incredible. Another thing about it was that the person that lived right next to them was a guy who we called the candy man. He actually was a salesman for candy. He was real old. He used to give us tons of wholesale candy all the time, just directly to the kids. You know, he'd just give it to us. So we always used to like going to go see him.

Then, in their apartment itself, again, it was just little things about it, all the goofy little things that she kept on the coffee table, funny little trinkets. Like she had this nutcracker. I don't know, we just played with it. You know, no particular reason. They had a clothesline out the kitchen window. We'd always be pulling on the clothesline, clipping things with the clothespins. The clothesline itself was a major source of entertainment, and just running around in this tiny little apartment was a whole lot of fun.

**HATHAWAY:** I take it you're talking about a time when there were at least three, if not four of you, then. I mean your brothers. Pretty much quick succession. You said your oldest brother was born in '51. You were in '53. What about your two youngest brothers?

**RUBIN:** Well, my oldest brother's Michael. My brother younger than me was Peter A. Rubin. He was born a year or two later also. And Ricky [Richard J. Rubin] was born maybe three or four years later. But it was relatively close together, so there would usually be a crowd of us up there.

**HATHAWAY:** Were the four of you close? Or was this more the fact that you were all going to

Grandma's house that you played together and "socialized"? That's not the right word for a bunch of boys who are between the ages of three and eight, I suppose.

**RUBIN:** Yeah. We did a lot of stuff together. We played and did all our tricks pretty much together.

**HATHAWAY:** That was true back in the neighborhood, then, too, wherever your hangouts were and things like that.

**RUBIN:** Yeah, I mean, we got in a lot of fights too. You know, my older brother had his own friends. There were a lot of conflicts between his gang and me. But at least when we were little we always played and did a lot of things together on our own, especially on a trip where we'd be going away like to Grandma's house, that kind of thing. So that's my grandparents on that side. Of course, we also liked to see them too. It wasn't just that we liked to play around the apartment. They also--

**HATHAWAY:** And the candy.

**RUBIN:** --spoiled us and doted on us. My grandmother made incredible food, beyond belief. I actually have photographs of the food that she used to make.

**HATHAWAY:** Can you--?

**RUBIN:** Well, she used to-- You know, we're all Jewish, and so a lot of things sort of were common in the Jewish group. Potato pancakes was her major specialty. She really worked really hard to make those, because she had to scrape the potatoes against this grater. It really was hard work. We knew it was really hard work to make these. But she'd always make them for us, and she'd always stuff us with them. There would always be way too many of them and things like that. So she made that. And she made some kind of chicken soup that we always thought was really incredible too.

**HATHAWAY:** Of course, and it was actually.

**RUBIN:** It was. I mean, yeah, there's nothing like it.

**HATHAWAY:** Was it the same kind of closeness with your mom's family as well? I mean, I guess they were still close by. Maplewood is even closer than Newark, right?

**RUBIN:** Yeah. A little bit, not that much different. We also would go to Maplewood. I don't remember how often we went to these places. To me it seems like we went there fairly often, but I really don't know. My mother's side was a little bit different. They lived in Maplewood. They had a really nice single-family house there. As far as I know, they were pretty well-off. My grandfather [Charles Rothauser], who I also never met, died just before I was born. He died between my oldest brother and me, so I never met him. My brother, if he met him, only met him when he was less than one year old. He died of a heart attack when he was in his forties. He actually died in Radio City Music Hall, watching a show there. He was a really, really classy guy. If you look at pictures of him, he was real handsome. His business was selling televisions, television sales. I think that's sort of when it really blossomed.

**HATHAWAY:** Yeah, if we're still talking '50, if he was still alive, '51.

**RUBIN:** I mean, between the time period of, you know, whatever, like 1935 or '40, and during my childhood, I think it was just a booming new business. So they were kind of well-off. I know they had a convertible. I've seen pictures of him in a convertible. Again, he's a real suave-looking character. So they did pretty well. We went to visit there too. We were crazy about that place too. But, again, not for any special things. I remember what the house looked like. I think it was some kind of English Tudor-style house. Again, there wasn't really anything other than this was a place for us to try and pull a lot of tricks and run around and—

**HATHAWAY:** Goof off and get good food and get doted on. It's not a bad deal.

**RUBIN:** My grandmother on my mother's side [Barbara Rothauser] never remarried. It was basically just her. Also, my aunt, my mother's sister, whose name was Ruthie [Ruth Rothauser], she died when she was very young. I can't figure out what age it would have been. I knew her pretty well. She probably died of cancer when we were maybe seven or eight. She had never married or anything. She was always there too. So it was really going to see Ruthie, also my mother's brother, whose name was Bob, Uncle Bob [Robert Rothauser], and my grandmother. The three of them were usually there, home.

**HATHAWAY:** They were younger than your mother? Your mother was the oldest? I mean, I maybe get the sense that they were---

**RUBIN:** No. My mother was the second one. She was between Ruthie--who was the oldest and

who died--and Bobby, who was the youngest.

**HATHAWAY:** I guess I maybe get the sense that you were kind of almost close to your Aunt Ruth as almost more like a friend or something.

**RUBIN:** Yeah. Well, she used to drive the kids around in the car. For example, she used to drive us down streets that had like water puddles in them. She'd make the water splash with the car. We just thought that was incredible. I mean, every time we saw her we wanted her to drive us in the car through a puddle so we could make the water splash. We thought that was doing something bad, I guess. I don't know. But we just thought--

**HATHAWAY:** Or your parents-- Your mom wouldn't drive the car through the puddle for you or something like that maybe.

**RUBIN:** Right. She really liked us and spent a lot of time with us, and we kind of thought of her as a friend.

**HATHAWAY:** Deal is a beach town. I don't mean that there's more people there in the summer, although I suppose to a certain extent that's true too. I know the beach is pretty nice down there. I mean, your families, your relatives, must have come down to visit you as well, I would think, to escape a hot Newark August day.

**RUBIN:** Yeah, they did. My mother's parents had an apartment on the Jersey shore. Before I was born, they had an apartment on the Jersey shore. They had the apartment as well as the house in Maplewood, at least for some period of time. As far as I understand it, the reason they had it was so they could come down in the summer and go down to the beach.

**HATHAWAY:** Did your mom maybe spend whole weeks of the summer where her dad would come down for--? Still, I guess, for a lot of people, a typical situation.

**RUBIN:** Yeah, I think so. Their apartment was in Asbury Park [New Jersey]. They eventually sold the house in Maplewood, which must have been when we were six or seven or eight years old. They sold the house in Maplewood. My grandmother just lived down on the Jersey shore in that apartment. So she was then close to us. And the same thing with my other grandmother, with my father's mother, Sonia. She also eventually sold her apartment or stopped living in the apartment in Newark and took an apartment down on the Jersey shore. The reason was just so that they could be closer.

**HATHAWAY:** And also in Asbury Park?

**RUBIN:** No. Hers was in Bradley Beach [New Jersey].

**HATHAWAY:** On either side.

**RUBIN:** So basically the grandparents that I knew were these two grandmothers, and, to a certain extent--I don't know what you'd call it--the step-grandfather. He died somewhere when I was little as well.

**HATHAWAY:** I also take it that neither of them are alive now. I mean neither of your grandmothers.

**RUBIN:** No.

**HATHAWAY:** Can you tell me maybe just a little bit more family history? I assume that at least in your father's case that perhaps his parents had emigrated from Europe. And maybe in your mother's case the parents were second generation, but they could still well have been first generation. I just want to get a sense of that--

**RUBIN:** No. My grandfather was first generation too. My grandmother was first generation also, on my mother's side.

**HATHAWAY:** So we're talking about all four--

**RUBIN:** Yeah, all four of them emigrated.

**HATHAWAY:** Do you know much about where they were from in Europe or whether they were married first in Europe?

**RUBIN:** Neither couple were married in Europe. They all met here in this country. I don't know how old they were when they came over. My father's mother, Grandma Sonny, didn't really

want to talk too much about stuff that happened before she came to the United States. So we really don't know a whole lot about it. I know that she lived in some kind of persecution or whatever.

**HATHAWAY:** Yeah, I mean, it didn't start all of a sudden in 1938, that's for sure. It was going on in eastern Europe forever. But I was curious about where in eastern Europe they came from, assuming it was eastern Europe.

**RUBIN:** They were from Poland. Both of my father's parents were from Poland. Then, on my mother's side, my grandfather was from Poland. My grandmother was from Germany. My paternal grandparents were both Jewish. Of my maternal grandparents, just my grandfather was Jewish, and my grandmother basically gave up her religion. She didn't become Jewish; she didn't become anything. She just, when she got married, gave up her religion totally. She never would talk about anything related to her religion or anything. She just didn't want to talk about it.

**HATHAWAY:** Was she still in touch with her family? As you say, she didn't talk about her religion. But did you have a sense that there were sisters, brothers, uncles, aunts?

**RUBIN:** Yeah, there were sisters, brothers, uncles, aunts around. We didn't know them very well. We didn't have a lot of contact with them. But some of them lived in the United States, and we did hear their names and things like that. But they weren't people that we had a lot of contact with or knew very well.

**HATHAWAY:** And we're talking about people who are really becoming adults, let's say, or meeting and getting married, what, in the twenties, I guess. If your parents married in '49. Maybe even later?

**RUBIN:** My father was born in the teens. I mean, maybe 1918.

**HATHAWAY:** Of course, what am I saying? I'm sorry. I'm skipping a decade here.

**RUBIN:** My father was probably born in 1918. So it would have been a little earlier than the twenties, in the teens.

**HATHAWAY:** So there really wasn't much of an extended family, I mean, a really large--

**RUBIN:** No, not at all. As a matter of fact, my father was an only child. There weren't any aunts and uncles on that side. My mother had a sister who died unmarried, early on in life, and one brother. So really there's only one uncle.

**HATHAWAY:** I guess I meant more kind of like their aunts. In other words, that they would have had cousins and a lot of--

**RUBIN:** Well, they had some.

**HATHAWAY:** Yeah, but it just wasn't something that necessarily extended to you, where there's a sense of these-- There are even family clubs and things like that that kind of kept connections going.

**RUBIN:** But we were in one of those clubs.

**HATHAWAY:** I'm being so roundabout here. Got any of these family clubs?

**RUBIN:** The club was centered in Florida. It was called the Cohen-Berensky Family Circle. To this very day I still get birthday cards from the Cohen-Berensky Family Circle. They have a way of making sure everybody gets birthday cards. But I myself didn't have any direct involvement. My parents didn't have a lot of direct involvement. I know they went to some kind of reunions occasionally related to it, but we didn't really know much about any extended family beyond that.

**HATHAWAY:** I think for many people that was something to get away from, as opposed to something to really kind of cleave to. So I'm just curious. I think that gives us a sense of your family and their sense of being really second generation, your parents being born here. But kind of where their sense of themselves lies. That's kind of where I guess I'm getting at. I'd also like to ask how they met, if they seemed to come from different economic situations.

**RUBIN:** My parents?

**HATHAWAY:** Yeah. How they met.

**RUBIN:** They did come from different economic situations, that's true. But, of course, my father went to dental school and was a dentist actually. And so his class might have been elevated just by virtue of the fact that he was a professional and was then making a good income. You know, I mean, basically, he worked his way through college and dental school by cleaning out rat cages at the University of Pennsylvania or whatever. So he became a professional and then became similar in income to my mother's family. A friend of my father's [Clifford Feinstein] knew my mother. She was a secretary in an office. He just thought that she would be good for him or whatever. He had him come and see her, just sort of clandestine, just to look at her.

**HATHAWAY:** Check her out.

**RUBIN:** Check her out. Then he just asked her out. So it was sort of a setup. And the guy who introduced them was also a dentist that I think my father went to school with. I'm pretty sure he did go to school with him. That's how they met.

**HATHAWAY:** Did religion play much of a role in the family? Were you aware of being Jewish? Or was it just more of a kind of a secular, cultural identification?

**RUBIN:** No, I'd say both. We were the Conservative class of Jews. We were in the middle in terms of the strict rules. We went to temple regularly. I went through training and bar mitzvah and all that sort of thing, and so did all my brothers. So the religious part of it was always there. I don't think the kids really took it super-seriously. I'm not even really sure my parents took it really, really seriously. I don't think it ruled their lives per se.

**HATHAWAY:** Yeah. I'm trying to figure out whether it was something that--

**RUBIN:** Well, being Jewish and participating in a religion was very, very important to the family.

**HATHAWAY:** Do you remember how you thought about participating in such things? And what your own feelings were about, for instance, going to temple or the training and getting ready for the bar mitzvah? Was it exciting and fun? Did it make you tremble and shake? Were you just bored with it? There are other options.

**RUBIN:** It was boring. There were parts of it that I liked. Learning the Hebrew language I

thought was kind of fun. That was one thing I kind of liked, but otherwise it was kind of boring. We never really wanted to go to temple. We always just went because we had to. We'd always get up and go outside for a little while during the service, because the service was pretty long. We'd go outside and stuff like that, and we'd have fun out there. It was fun, because we'd meet friends there and things like that. But we thought it was boring, or at least I did.

**HATHAWAY:** How about your parents? Do you get the sense that it was not an obligation but a social thing, again, where they would meet friends?

**RUBIN:** It was, but for them it was more religious too. They definitely thought it was really important. They didn't think of it as being boring per se, I don't think. They wanted to go. They wanted to do all-- I don't know whether it really, again, ruled how they conducted their life per se.

**HATHAWAY:** But it had an important role in their day-to-day life even, so it's something that they, as you said, took seriously and looked forward to or participated in willingly. Whereas perhaps you went because that's where your parents took you. If you don't mind-- Is it something that you pursue today? I mean, do you go to temple still?

**RUBIN:** I have gone to temple kind of regularly, like for high holy days and things like that. But I got married to a Catholic woman [Gretchen Gearhart Rubin]. She's really religious, and we raise our children Catholic actually. I spend a lot of time with them. I go and sit around in the church with them and stuff like that. I don't really find the time to do that much more than that, so I really hardly practice it actively at this point. Except on high holy days I take the time off, and sometimes I go to temple on those days by myself.

**HATHAWAY:** How do you respond--? I mean, when you're going to church, is it as much to be with your children? Or are you finding that there is something spiritual to be got from going? It must be kind of interesting to somebody who has gone to Conservative temple for quite a bit now to be going regularly or at least have certainly a lot of exposure to the Catholic religion. I mean, you have a unique experience here, I guess. I guess not "unique" but rare. What do you think about it? How would you compare the two or something like that? I'm just curious to see how you kind of see the two together like that.

**RUBIN:** Well, I don't know. For me it's just time to sit sort of quietly and think about things and take time out. You know, I do believe in God, and it has to be in my mind that it's the same God. It's just time to sort of think and in a way be thankful for all the great things that have happened. Sometimes it's a little bit weird, because you know that all the people there are all Catholic and they believe in Jesus Christ. Yet I can't conceive of believing in Jesus Christ. It

means nothing; it doesn't mean anything to me. It's really, really foreign to me. So most of what's being said constantly in words in the church I just sort of reject. But just sitting there quietly being with the family, trying to keep the kids quiet, sort of being with a lot of families that are there together with their family--because it's a real family community--for me it's a really nice, a really, really nice experience. In my mind, the sermons are almost the same.

**HATHAWAY:** You mean the same that you'd hear in a temple?

**RUBIN:** Yeah. I mean, the two things I liked about temple I like about church too. One is the sermon, because at least you can listen to something that somebody thinks about something. In other words, it's not some things that you're reading out of a book that--

**HATHAWAY:** The same every week.

**RUBIN:** And they're in this very sort of weird language.

**HATHAWAY:** It used to be. The Roman Catholic [liturgy]—

**RUBIN:** Even if it's in English, the way the words are is sort of like poetic and you can't really relate to it. The two things I really liked about temple were the music and the sermon. They were the things that at least I could kind of look forward to. And the same thing is true when I go to church with my family. I do really like the music and the various things. I get used to that, and those things sort of run around in my head. They're sort of pleasant songs that end up sort of running around in my head. That's really nice. It was the same in the temple. And the sermons, I listen to the sermons. They usually have something to do with sort of a current event. So it's something to think about. It's nice.

**HATHAWAY:** The decision to raise your children as Catholic-- Was it something that your wife wanted and it wasn't an issue for you? Or is this something that you think is a good idea as opposed to raising them in the Jewish faith or raising them in no faith at all?

**RUBIN:** Yeah. I think it's a good idea to raise them in a faith. I'm not sure why. I guess it makes me feel more comfortable that they're being raised one way or the other. Maybe it makes me feel too out-there, too uncomfortable, to raise them in no religion. We both think that it would be too confusing for them to raise them or to expose them to all different religions.

**HATHAWAY:** Maybe when they were older. Maybe somebody could take them to temple sometimes.

**RUBIN:** Yeah. The other thing is that, at least formally, for us to get married in the Catholic church-- essentially, again, formally--meant saying, at least saying, that we were going to raise our children Catholic. If we didn't say that, then they wouldn't marry us in the Catholic church. Gretchen wanted to be married in the Catholic church. So we couldn't do the things-- We couldn't say those things. That doesn't mean we have to raise them Catholic. We can do whatever we want to. At least formally, that's sort of a commitment that we made. But it didn't bother me too much because it was in sync with the idea of one religion, you know, raising them one religion, regardless of what it is, and go from there. It didn't bother me.

**HATHAWAY:** And they're still awfully young. If I'm correct, two of them really aren't even aware that there is any distinction at all between such things. It's where everybody goes on Sunday morning. For the oldest, maybe she's just now becoming aware that you go somewhere else sometimes and on a different day or whenever it may be that she's aware of at this point.

I know we kind of got off on a tangent and came up to very current time. Those kinds of things happen, and I think that's interesting. To try to get back to your family or to your childhood, your parents-- Has there been any reaction to the fact that their grandchildren are--? I don't even know if your parents are still alive, to be quite honest with you.

**RUBIN:** Yeah. My parents are still alive. My father doesn't say anything about it. My mother is freaked. She cries. She's pretty upset about it.

**HATHAWAY:** Because this is like blasphemy or they're going to not be--

**RUBIN:** She just feels like she's missing out on some experience. She can't understand why would I even go out with somebody that's not Jewish in the first place. She loves Gretchen. I mean, she thinks Gretchen is a great person, and she's really-- She spends a lot of time with my mother on the phone and when she comes to visit, and she's a real good talker and they go out together and things like that. But she just can't understand why I ever initiated the whole thing. Why would I ever go out with somebody that's not Jewish? Why would I even conceive of being in a family that's not Jewish, when she would never think of that? It would be such a foreign thing. She would never consider it. It wouldn't happen.

**HATHAWAY:** And of course she's made the adjustment to facing-- I mean, here she has a daughter-in-law who's not Jewish, and she can still like love her or whatever and treat her as she would any other daughter-in-law whether they were Jewish or not, I guess. That's interesting

that they still have those feelings about those things, and yet when it comes down to the actual fact kind of perhaps set those feelings aside or whatever.

**RUBIN:** They kind of have to block it out to have a good time. I don't know what to say to them to change that. I wish she didn't feel that way, because I don't like her to be feeling in pain or sad about something which for me is the greatest thing in the world. I mean, these kids are-- I'll show you pictures of my kids [Elizabeth Kathryn Flock, Jane Sonia Rubin, and Lucy Anne Rubin]. They're absolutely the most wonderful. You know, they're just super. And my parents recognize that. They love them. They're great. There's nothing that's not great about them. It seems unnecessary in my mind to have this sadness or pain associated with it. I guess I can understand it a little bit, but I really wish I knew how to erase it. But I don't know how, I have no idea how to do that. I guess I don't think it's possible for me to do it. So it just is there.

**HATHAWAY:** I wonder if-- And maybe this isn't so much a question that I'm posing to you as opposed to just a rhetorical question, which, well, I could pose to you-- What the difference is between generations--especially as it seems to have happened, I think, much more with your generation--that these aren't issues for you. That Gretchen is Catholic or Jewish or green or blue aren't issues. But yet for your parents' generation--and they were born here too--it is.

**RUBIN:** Well, I don't know. But I think for them, their becoming a clan, being clannish, is what saved them. And for us, what we see as we're growing up is these different groups hurting each other. You know, like blacks hurting whites and whites hurting blacks. That kind of stuff. We see all that. You know, people hurting each other by being cliquish and clannish and separatist. And so as we're growing up in the sixties and seventies and whatever, in my mind, I think, we can't be that way. We have to love everybody. Everybody's a person. Everybody is the same. There's no reason not to be friends with somebody that's a different religion or a different color. Our survival depends on that. Our survival depends on getting along with everybody. Because if we don't, we're going to have riots. Whereas their survival was by being a clan and their strength was by coming together and fighting off their foes. So that's how I grew up.

**HATHAWAY:** I never thought of it quite that way.

**RUBIN:** I mean, there were riots in Newark when we were little. And there were riots in Asbury Park, New Jersey, when we were-- They were very big riots. I don't know if you remember.

**HATHAWAY:** I wasn't living there at the time.

**RUBIN:** I was in high school then. That's what we grew up with seeing, people that were different killing each other.

**HATHAWAY:** The riots in Asbury were in '67, '68?

**RUBIN:** Let's see, I graduated from high school in '71. Yeah, it's between '68 and '71. I thought it was in the later part of that--

**HATHAWAY:** Yeah. Well, it could have been-- Yeah, it could have even been much later. The Watts riots and Detroit are either '66 or '67.

**RUBIN:** Newark happened first. The Newark riots happened first, and then the Asbury [Park] riots came after that.

**HATHAWAY:** Now that we're back in Asbury Park, we're back in the area of Deal, which is where we should be, I guess. I was curious. I have an idea of what Deal was like, let's say, even ten, fifteen years ago, but not maybe before that. I'm wondering if you could kind of give a description of what growing up there was like. You talked a little bit about how you went out with your brothers and the tricks and games, but we didn't really get a sense of what they were. What do you do when you're seven or eight or nine years old, after you come home from school?

**RUBIN:** We moved around a lot within Deal. For some strange reason my parents moved like five or six times in my childhood, but most of my childhood we lived within a block of the actual beach. So everything was centered on the beach. It didn't matter what season it was. We did everything in relationship to the ocean. In the winter, there's a cliff that goes down to the beach, and so you'd go sledding right up to the water, right into the water sometimes. We really spent a lot of time on the beach. We did things on the beach. There were jetties that went out into the water, and we'd climb and there'd be caves and things in the jetties that we would go into. We would collect things on the beach. We didn't fish very much. I was very big on surfing. You know, I surfed since I was ten. I started when I was ten. So we really did everything in relationship to the beach, I'd say. We did a lot of stuff down there. That was really a major thing about living there. Deal itself is a wealthy, exclusive small town. It was very nice. The houses were big, and there was lots of room to run around.

**HATHAWAY:** Big yards. Quiet streets.

**RUBIN:** Yeah.

**HATHAWAY:** What was school like, something that impressed you, something that bored you to tears?

**RUBIN:** No. I really liked school a lot. I went to Deal elementary school. I liked it throughout. I liked school throughout. The only part I didn't like was sports. I mean, I actually wasn't very good at sports, so going to gym class was always crummy, because, you know, I'd always be the last one picked on a team. And I wasn't very good. So that was kind of a stress, because I wasn't very good at those kind of things. But other than that, I mean, the school, art, music, it didn't make any difference. I liked it all.

**HATHAWAY:** And you did well in all--? Do you think that was maybe part of it, or that you excelled and that's why you hated sports? I'm just thinking that that must have been a downer every time you went to gym to realize, well, "Here's the one time I really feel--"

**RUBIN:** Yeah. I used to get C's and D's in gym. It seems like that would be unfair, because it wasn't like I didn't try or anything. I think these days you would probably still get an A if you tried hard. It didn't matter whether you could actually get the ball in the basket.

**HATHAWAY:** They graded you on motor skills? I mean, that doesn't seem quite fair, does it? Or at least to those of us who got picked last it doesn't seem fair.

**RUBIN:** No. But I guess I did well. I guess I liked it, because I did well. Or I did well because I liked it. I don't really know which.

**HATHAWAY:** It's hard to separate that cause-and-effect kind of thing. What parts of it struck you as the enjoyable part? I mean, is it answering a question in a class? Maybe I should try to be more specific and even ask, what subjects did you like the best and why?

**RUBIN:** I guess I liked science and math. I liked solving the problems. I know I liked math. I liked being able to figure out the algebra. We learned algebra in grammar school for sure. I just thought that was neat.

**HATHAWAY:** Really? You know, we're talking fifth-, sixth-grade algebra? Really?

**RUBIN:** Well, our elementary school went up to eighth grade, so it was probably more like seventh grade and eighth grade that we did some algebra. That I really liked. We had a science class, and I always thought that was fun. I also liked art quite a bit.

**HATHAWAY:** What kind of class was the art class? I mean, they give you a box of crayons and say go to it?

**RUBIN:** No. We did different projects. I really can't remember them very clearly at all, but we did a lot of projects. I know I really liked the art teacher. I was kind of crazy about the art teacher. I thought she was a really neat person, and she paid a lot of attention to me, I guess. But we did projects. I can't remember specifically what we did. I know that myself and a friend of mine named Steven Ediken, we always thought we were sort of her favorite kids. She used to have us come up to the art room, which was this incredible room that had all these supplies all around, tons of supplies all around. I know we used to cut paper for her. She had to make strips of paper for a certain project or whatever.

**HATHAWAY:** Those little rings at the holiday time or something like that.

**RUBIN:** Yeah. Those kind of things. So we'd help her do those things. I don't know. It wasn't that I was a great artist or anything, but it was usually some kind of thing, constructing something, making a model of a house. I can remember doing something like that. We'd make like an architectural thing. We made a house with a grass lawn and somehow did that. I guess that was fun. I liked doing that.

**HATHAWAY:** Again, we're talking about maybe seventh, eighth grade, the end of elementary school. Most of it, then, before that seems rather a blur or--? Are there any other favorite teachers, maybe, earlier, or even teachers that you remember?

**RUBIN:** I do remember the teachers. I was one of the top students in the class. You could tell where you were in the reading because they had these special levels that you could get to.

**HATHAWAY:** Colored books or something like that.

**RUBIN:** Yeah. I was always way up there, I guess. But I don't know. I enjoyed it. I enjoyed the challenge. I enjoyed the little motivations that they gave you to do things. I liked a lot of the

teachers. It wasn't any particular teacher. My impression was that all the teachers were always very nice to me. I thought they were neat people. They seemed to be real excited about teaching. Just in general, it was a real positive experience, a real great place to be.

**HATHAWAY:** What about your brothers? How did they respond to school? Basically all the same way?

**RUBIN:** We all did pretty well, I guess, early on anyway. My brother Mike, who is real smart, eventually got a Ph.D. in physics. He was much more--

**HATHAWAY:** He was the oldest?

**RUBIN:** He's the oldest, yeah. He was much more mischievous. He got in a lot of trouble at school and things like that, skipping out on classes or doing things he wasn't supposed to do. But he had the capability. He got his grades together one way or another. He was a little bit more mischievous. But we all had good scholastic aptitude.

**HATHAWAY:** May I ask what your brothers are doing now in the way of careers?

**RUBIN:** Well, my oldest brother Mike is a physicist at the University of California at Berkeley. He works at the large Berkeley labs in a department called windows and lighting. He develops these films to put on glass to prevent or keep heat in or let heat out or whatever you need to do with heat. He's doing pretty well with that. He's been in that career for a long, long time. He's been at that one place for many, many years. The one just below me, Pete, has been through a few different careers. Basically he was trained to be a teacher of secondary education in Vermont. He went to Middlebury College and then stayed in Vermont as a teacher. He taught in an alternative-style school for some years. Then he decided to go back to school to learn architecture. He just graduated from architecture school [Rensselaer Polytechnic Institute] about a year ago, or within the past year.

[END OF TAPE 1, SIDE 1]

**RUBIN:** So he just got out of architecture school and he is basically looking for a job, which is very, very difficult in that field.

**HATHAWAY:** Yeah, especially in this economy I would imagine it must be really tough.

**RUBIN:** Yeah. He's in Vermont, and Rick is in New York City now. He's an interpreter for the deaf. He works in a school in New York City called Lexington School for the Deaf, which is kind of a famous school for the deaf. He doesn't really like doing it anymore. He's been doing it for a lot of years, and I think he's burned out maybe is the right word. It's maybe a little bit tedious.

**HATHAWAY:** All the talent, and after a while it becomes rote or something. You hit a limit where you kind of—

**RUBIN:** Yeah.

**HATHAWAY:** I guess we really were talking more about junior high than high school. We don't have to cover this year by year or anything, but does Deal even have a high school? I mean, was it, again, rather-- I don't want to use the word isolated. You know, small. I mean, I take it Deal elementary school didn't have that many students and was a small-classroom-size sort of situation. Was the high school like that too or was it regional?

**RUBIN:** No. The high school was Asbury Park--regional, yeah. We went to Asbury Park High School.

**HATHAWAY:** Was that a real adjustment for you?

**RUBIN:** It was really a lot different. And I might have been a little bit scared going to Asbury Park High School, but—

**HATHAWAY:** Especially, I guess, since, as you were saying, the riots really were happening when you were in high school, right?

**RUBIN:** Yeah. It was towards the end of high school that the real riots occurred. I don't know. I really wanted to go there. My parents put my brother at CBA, Christian Brothers Academy [Middletown, New Jersey], for one year because it was said that Asbury Park High School wasn't a really great place to go to, that academically it wasn't very good. If you were college bound, you wouldn't be able to do what you wanted to do. Maybe there was some element that it was kind of dangerous there. But he only went to CBA for one year, and then he just insisted that he didn't want to go there anymore. We all wanted, for whatever reason, to go to Asbury

Park High School. I don't know if we craved to expand our horizons or what. My memory of it seemed that way to me, although it seems hard to believe that as an eighth-grader I wanted to expand my horizons.

**HATHAWAY:** What about friends? I mean, weren't all your friends--or most of them--going to end up there anyway?

**RUBIN:** Yeah, that's true. They were all going to go there. So that probably was a big issue.

**HATHAWAY:** Or did a lot of kids go on to private high school?

**RUBIN:** Not really. You would think that it would be that way in that kind of a community, but it wasn't really that way. A few did, but most of us went to Asbury High School. Asbury High School was-- It should have been a total culture shock for me, but I don't really remember it that way. I was scared. I don't want to say I wasn't scared going there initially, but I accepted the culture shock as really, really interesting or fun or whatever thing. You know, it was 50 percent black, so we were being exposed to kids who were black, which for me was a new experience. It was like 5 percent college bound, which is incredibly low. So the college-bound ones were all together in certain classes but not all classes. We weren't together for gym. We weren't together for languages. We weren't together for homeroom or study hall or some of the other elective things that we might have taken. But we did spend a lot of time together in math and science and so on. Being there every day was this incredible challenge of mixing with the people that were there.

**HATHAWAY:** Was there a lot of mixing? Was it pretty much, as you said, you were in a classroom with a lot of other people who were college bound? I'm not making any distinction that the college-bound people were exclusively white or anything like that, or that the only kind of difference or distinction to be made was between students of color and white students. But was there, I mean, only 5 percent--? I almost get the sense you're talking about being a minority yourself in a different way. I'm wondering if you had much exposure to or you mixed with, for instance, a lot of students who weren't going to college.

**RUBIN:** We did. We mixed up a lot. I mean at least I did. Some of my friends who were on sports teams-- Well, I was in sports as well. I swam. But the swimming team wasn't as mixed up, I don't think, as some of the other teams. But some of my friends were on the basketball team, football team. Maybe through them I met a lot of people that I might not have met otherwise. We spent a lot of time with people that weren't in the college-bound group. I don't know. That part of it was really, really good. It was really great for me. It seemed like it was a challenge all the time.

**HATHAWAY:** How do you mean that?

**RUBIN:** I mean it was a challenge in the sense that, you know, like a black-- There was this one particular guy. I can't remember his name right now. I might think of it later.

**HATHAWAY:** Pull out that high school yearbook!

**RUBIN:** For some reason he'd always bug me: "Now, tell me, really, you have a black maid in your house, don't you?" He'd always ask me if I had a black maid. I remember him really well. But he really liked me. He liked eating lunch with me. He was kind of a cool kid too. But for some reason he was as curious about me as I might have been about him. We spent a lot of time together. We actually ate lunch together a whole lot. Things like that happened all the time, every day. It wasn't comfortable. It wasn't like we were comfortable every day. In fact, we were uncomfortable every day, because the socialization that was going on and the fights and all the things that go on every day weren't comfortable. But for me it really was sort of exciting. "Exciting" is not really the right word, but it was very stimulating. I had a tremendous amount of curiosity about it. I had a tremendous amount of curiosity about how can all of us be friends and how can all this work out and how can we all just be happy. Because I didn't just want to hang around with rich, white, Jewish kids. And I don't know. It worked out. It was fun.

**HATHAWAY:** How large was the student body at the high school? Are we talking two thousand or two hundred?

**RUBIN:** I think there were about sixteen hundred in the school, four hundred per class. It wasn't a huge high school.

**HATHAWAY:** It's just Deal and Asbury Park? Or also a few other communities?

**RUBIN:** No, no, it was more--Bradley Beach, Belmar. There were quite a few towns that went there.

**HATHAWAY:** Yeah. The smaller beach towns, I guess. Asbury Park is really not that big of a town really. Maybe for the area, but just-- I'm wondering if-- Perhaps it's not fair to ask you to compare the situation then to now or something like that. But since the riots were, as you said, probably '70, '71, in Asbury Park, do you have an understanding of why things might have been

so tense at that particular point in Asbury Park, and in Newark as well? How you responded to that or what your feelings were about not only being in--? I didn't grow up that close to Asbury Park, but I know the area somewhat, and I know that in the later seventies, when I was in high school, that there wasn't the situation-- There was a kind of tension that you're describing in a place like Asbury Park High School-- Or I'm trying to think of some of the other high schools in the area that might have had a more mixed population, like the one I went to. I was just wondering if you knew why? Or had a sense of—

**RUBIN:** Well, there was a big black community. It was centered around a street called Springwood Avenue, which actually was listed as one of the most dangerous streets to be on, one of the ten most dangerous streets to be on in the United States or something like that at one point. So the conditions were pretty bad. The housing, you know, the economic conditions, were really, really bad in maybe what would be a small area, if you compared it to Newark or New York, but nevertheless the conditions were like the ones that you would see in Newark, New York. The people lived in crummy housing and didn't have the things that they needed. Even though it was a smaller thing, the results were pretty much the same.

**HATHAWAY:** I mean, I guess for central Jersey that really, in a sense, was the-- But I'm thinking of Red Bank and other situations where there wasn't later, let's say, six, seven years later, the kind of real tension and--

**RUBIN:** Well, it was better. Six or seven years later it was less in Asbury Park. I don't know why it cracked there more so. I guess it was just a bigger mass of people for it to happen to. Maybe it was broken up more than some of the other towns, but the black people lived in a very, very, very well defined area on the west side of the railroad tracks.

**HATHAWAY:** Do you remember--? Did you stay home from school during the riots?

**RUBIN:** Oh, yeah. School was shut down for days and the police were all in the school after that. During the riots itself, which happened-- I think they started sort of in the afternoon on one particular day. It might have been a weekend day. It wasn't like we were evacuated from the school for it. From Deal, we just saw smoke rising from Asbury Park. We were really, really scared. As far as we knew, we thought some angry mob was going to come over and destroy Deal just because we were wealthy. Nothing like that ever happened. That's not what happens in riots. Basically, they just burned their own-- Springwood Avenue was burnt down. Springwood Avenue did not exist after that. There were no buildings on Springwood Avenue. It all went up in smoke. We didn't really understand it very well.

**HATHAWAY:** But you went back to school eventually, I mean in a couple of weeks--

**RUBIN:** Yeah. A couple of days later we went back to school.

**HATHAWAY:** Did it influence you, do you think, in any way? Has it had some lasting effect? I guess I'm pursuing these questions because I just went through some riots myself, not that far away but not that close. I'm curious as to my own reaction now. Maybe I'm just really asking these questions as I think of them for myself.

**RUBIN:** I wouldn't call it a key thing. It was part of all of--

**HATHAWAY:** Growing up.

**RUBIN:** All of the whole issue of-- You know, here I'm fairly well-off, and here's these other people that aren't very well-off, but I'm getting to know them in school and I really like them. I'm sure that that formed part of my ability to sort of care about other people. I never really knew what to do about it, but I'm sure it affects the way I think about—

**HATHAWAY:** Well, if you figure it out, you should tell somebody, because I don't know that many of us have figured it out yet either. It's still going on. I don't know if there are other things you want to--? We're talking about your adolescence. I guess for every person adolescence is a trying as well as an exhilarating time. I never really quite know how to ask, to pursue people-- Do they want to talk about dating, or not dating, as the case may be, or what you did for fun? Or do you want to just move on to other things?

**RUBIN:** I don't know what's important. I don't know what's important for the process.

**HATHAWAY:** I think it matters to the person. I'm curious as to what might be your social life in a place like Deal and Asbury Park in the late sixties, early seventies. Just in a general way, part of growing up in America or something like that. But if you're not particularly interested in pursuing it we can move on.

**RUBIN:** I had a group of friends. We spent a lot of time together and did a lot of things together, some of which involved a lot of water activity. I was particularly into swimming and surfing. We would do that for as much of the year as possible. Even in the dead of winter, we'd put on wet suits and go surfing before school, things like that. I mean, surfing ruled. We just thought that that was the most incredible thing that a person could possibly do. It was just you. I

wouldn't call it exactly a natural thing, because you had to have a surfboard. But sitting out on the surfboard in the water, at six o'clock in the morning, when the sun's rising, usually with somebody else, and talking, and sitting on the surfboard waiting for a wave to come and talking to the other person-- I mean, it was a really, really great, great activity, great thing.

**HATHAWAY:** You can't surf on Lake Michigan, huh?

**RUBIN:** You can. People surf, people do surf on—

**HATHAWAY:** Wind surf or real surf?

**RUBIN:** People real surf. When there's enough wind, then you get enough waves. It's mostly, I think, down at the south end where you can do it. Not in Chicago. You have to drive down to Indiana.

**HATHAWAY:** I thought you meant the South Side of Chicago.

**RUBIN:** Again, probably because of the fact that I wasn't very good at other kinds of sports-- This was more balance and not nearly so much in terms of strength. I guess I was able to do it anyway. So for me it was a sport that I could identify with. I just couldn't stop doing it. I mean, I want to do it right now.

**HATHAWAY:** Really? When was the last time you went surfing?

**RUBIN:** Not for a couple of years.

**HATHAWAY:** I must say, it must be hard here in the middle of the country to find it as convenient as perhaps even when you were in Philadelphia or something like that.

**RUBIN:** Yeah. One time I was in California visiting my brother when he lived there, and I went surfing. And occasionally when I've gone home--but not very much recently--I'd find a surfboard and go surfing. It's hard because it's illegal. I mean, it's basically illegal. You have to do it in a place that's approved for it, and there's got to be a lifeguard and all this stuff. But I would never do it then. I would do it like in October. Then the police would come and they'd kick you out and all that stuff. That happened a lot. So I basically haven't been doing it very

much anymore. You know, we didn't care about getting arrested when we were seventeen years old, because they never really arrested you, but now we care about it. It's a major thing. I think about surfing all the time.

**HATHAWAY:** Well, maybe you'll be able to find more time to do it or end up moving somewhere where you can or go down to Indiana, I suppose, when the wind is right or something like that. I guess the swim team was a competitive thing. I mean, the swim team was part of the high school. Year-round? Just part of a season, like football?

**RUBIN:** Yeah. It was a winter sport.

**HATHAWAY:** Were you guys really a good team?

**RUBIN:** No. We were a really bad team. We always lost. My senior year, when I was captain, I think we might have lost every single meet. As a team we were really bad. Individually, I did win reasonably often, but I was never really great. I made it to the state meet as an alternate. That was the peak of my career. So I wasn't even at the sort of state level. But I don't know. Again, it was just another thing. I just really liked it a lot. It was a team, and it was something that to a certain extent I excelled at. At least people looked on me with hope that at least we'd get some points. That was pretty neat.

**HATHAWAY:** I was on a swim team once that lost a lot too, so I have a feeling how you feel. But I loved swimming, so it was fun. The practice was the best for me. I enjoyed the hours and hours of just swimming. The meets I didn't like. You were just in there and out in two seconds, and you had to sit there and wait then. When you practice four days a week for two, three hours, I always felt good when I was done, exhausted but good.

**RUBIN:** Yeah, definitely.

**HATHAWAY:** What about social things? I mean, again, without asking you the sordid details of your adolescent sex life or something like that, did you go to the movies, dates?

**RUBIN:** Yeah. I was kind of shy, but I had a few different girlfriends in the high school years for like short periods of time. I went on dates and went to a lot of parties and things like that, but I definitely would be considered to have been really shy. I wasn't a wild and crazy guy. You know, we did a lot of things as a group.

**HATHAWAY:** Now “we”-- I mean, perhaps that’s also something I need to maybe explore a little bit further. Who makes up this group? Are you still talking about your brothers? Or are we talking about actually friends who we don’t know much about yet?

**RUBIN:** Well, we did have a group of friends. Actually, I have to admit, most of the really close friends that I spent a lot of time with did live in Deal. Even though we spent a lot of time with other people at school, the amount of time outside of school that we spent with them was somewhat limited. First of all, they didn’t live anywhere near us. So I hung around on the weekends with people that lived nearby. There were a few really critical, really critical, really close friends.

**HATHAWAY:** Are you still close to any of them? Are you still friends with some of the people from high school?

**RUBIN:** Well, we kind of keep up on where each other is, but basically through our parents. You know, they bump into people at different times, but I hardly bump into anybody. There’s one guy named Jay Greenspan who I’ve kept up with. He was a really close friend. There was another guy who really was our other very close friend whose name was Steve Ediken, but he died when I was in Minnesota. That was between 1982 and 1985. The three of us spent a lot of time together when we were young. And again, Steve died, but I do keep up with Jay a little bit. I don’t know what to say about them. They were very important to me. I keep up with them to a certain extent.

**HATHAWAY:** Again, maybe this is just more my own personal experience, but I always got the sense that coming along really four, five years later, I missed something about politics and maybe some awareness on the part of teenagers of something wider than their neighborhood or their town. That I didn’t feel I had-- You know, when I was in high school the sixties were over, because it was 1974, ‘75 and whatnot. I was wondering if you had more of an awareness or you were involved in any of the political issues of the time? Although we’re talking now, really-- I guess you graduated in ‘71, you said. I want to make sure. The civil rights movement, I mean, was still-- Well, I think of ‘68 as kind of a watershed. Just so many different things I remember as-- Again, being a much younger kid, and not really participating in that sense, but that other people were. I’m wondering what you thought about what was going on at the time. [Richard M.] Nixon and the list goes on and on and on.

**RUBIN:** Well, we were basically-- I mean, I was in the anti-Vietnam War movement. We went to marches. We had one demonstration directly at Asbury Park High School related to that. We went to New York for the huge, huge, gigantic marches that would occur every once in a while. My friends and I had long hair, and we’d wear peace signs, wore peace symbols. We took an

American flag, and we painted directly on the flag, with black paint, the peace sign. Then we carried that to New York City. We thought we were going to get arrested, because it's illegal to deface the flag. We were pretty sure we were going to get arrested, and we didn't. We cared, but we decided to do it anyway. So I was involved in that.

**HATHAWAY:** I can't remember whether you would have been eligible for the draft or not.

**RUBIN:** I registered for the draft in late high school, I guess when I was eighteen.

**HATHAWAY:** I think it's people who were born in '53 or-- I don't remember where there was a point when--

**RUBIN:** Then when I was a freshman in college, I was in the lottery. My number was in the three hundreds, and I never got picked.

**HATHAWAY:** I was one of those ten years in between when not even registration was required. Whereas my brothers had to register and---

**RUBIN:** I didn't want to register. I didn't want to register, but I decided to go register. I remember going to register. I didn't do anything major. As soon as I got my draft card, I ripped it up, which is illegal as far as I know, and I pasted it on a piece of paper so that the pieces would sort of fit together, and I framed it and I put it on the wall.

**HATHAWAY:** What did your parents think about that?

**RUBIN:** They didn't say too much about it. I'm sure they weren't thrilled about it. But I think they were anti-Vietnam War too.

**HATHAWAY:** Many, many people were. You didn't have to be between the ages of fifteen and twenty-one to feel that way. Although, I think, perhaps, with the kind of youth movement or a lot of other things that were happening at the time, people tend to look back on it as-- You say you went to demonstrations. Were you an organizer in any way of any of that, or were you just more of a participant?

**RUBIN:** I was just a participant. I felt like I really wanted to do stuff, but I just followed along.

**HATHAWAY:** I guess really we should continue on. Unless you feel that there's something more you want to discuss about high school, we should kind of move on to your decision to go to Penn [University of Pennsylvania], or nondecision. You said your father went to Penn earlier, so I assume that that may have had something to do with it.

**RUBIN:** It had a little to do with it. I didn't want to go there, because I wanted to go to a school in the country. Going to the city seemed ridiculous. Why would anyone want to live in the city? I didn't want to live in the city. So almost everywhere that I applied was in the country. I remember applying to a fair number of colleges.

**HATHAWAY:** Like? Could you give the--?

**RUBIN:** Rutgers [University] was like my safe school.

**HATHAWAY:** Wasn't it everybody's who lives in Jersey? Or your mom made you. My mom made me.

**RUBIN:** And I applied to Penn as well, because I thought, "Well, it's partly a safe school," because at the time it made a difference whether you parents went there. My father had gone to dental school there. So I decided that I would apply there, but I didn't want to go there. I figured that would just be if everything else fell through. Well, everything else fell through. I didn't get into any schools at all except for Rutgers and Penn. I decided, "Well, I really don't want to live in the city." This is at the time. Now I'm very enthused, of course. But I didn't want to live in the city. I said, "Well, I'll go to Rutgers." But Rutgers isn't very-- It's a good school. It was a good school. But it wasn't as great as Penn, so I decided to go to Penn.

**HATHAWAY:** Do you know why the others fell through? Do you think you were just shooting for the stars? I mean, you crapped out on your SATs [Scholastic Aptitude Tests]? Do you know why?

**RUBIN:** No. I had good SATs. I was in the top five of the class in high school.

**HATHAWAY:** Do you think it was the high school? Or the fact that so few people were college bound?

**RUBIN:** I don't know. I think I was just unlucky. I mean, I think I was very, very lucky, actually, because Penn was fantastic. But as far as getting into those specific schools that I thought I wanted to go to, I just think I was unlucky. Because on paper I looked fine. I mean, I had the numbers. I really don't know why. Maybe I wasn't very impressive in an interview. I don't really know what it took to get into college in those days, but I think it was just maybe unlucky.

**HATHAWAY:** Yeah. I'm not aware of the ins and outs or the requirements beyond the typical standard ones that, of course, were the same when I was going to school or applying to school, I'm sure. So you went to Penn, and you're glad you went there now. Were you glad you went there after you got there as well?

**RUBIN:** Well, you know, there's one thing we didn't talk about that's incredibly important.

**HATHAWAY:** Okay. I'm so sorry.

**RUBIN:** Now I just thought of it. One of the really major things that happened to me which spanned high school to college was that I worked in the summer at a camp for handicapped kids. That camp was called Camp Oakhurst. It was very close to where I grew up.

**HATHAWAY:** Was it in Oakhurst?

**RUBIN:** Yeah.

**HATHAWAY:** I'm so bright, aren't I? I thought Oakhurst was farther north though.

**RUBIN:** Not much, just a little bit. It was a sleep-over- type camp for kids from New York City that had physical handicaps. At first I volunteered there. After volunteering there for a couple of weeks, one of the counselors-- I think I was too young to be a counselor, so I volunteered. After I was there for a few weeks, one of the counselors left or quit. They really needed a counselor, and they asked me to be a counselor, even though I wasn't old enough. So I started being a counselor there, and I ended up staying there for every summer for four or five years as a counselor. It was late high school, all through college, and then actually even into med school.

I went there every summer. That was truly, truly a very major experience for me. Most of it really took place in college, now that I think about it, but it started in high school. I think

the requirement must have been that you had to be in college--and I was in high school--but they took me anyway because they were desperate. And I stayed on there. That was just an incredible, amazing experience. It spanned high school, college, and medical school, now that I think about it.

**HATHAWAY:** Let me see if I can get this right. You volunteered because you couldn't work, but you wanted to? I mean, I'm trying to get a sense of why you volunteered there originally, I guess.

**RUBIN:** Well, even then I had some idea that I was interested in the medical field. This boy that died-- Steve Ediken's father was a surgeon. I always thought he was really neat. I just thought he was an incredible person. He was good with us. He sort of knew how to talk to us. He respected us or whatever. And I just thought he was a neat person. He also was a surgeon, so he was sort of a role model for me in that sense. He took us to the hospital once to observe some surgery, which I'm not sure was the best idea. I actually fainted during the surgery, but that didn't deter me at all. In addition, at the similar time, we joined-- I had been in the Boy Scouts and I joined an Explorer scouting troop that was based at a hospital. The Explorer troops tended to be focused on one issue. Like it might be a mountain-climbing Explorer troop or it might be a hospital Explorer troop or it might be a radio-broadcasting-station Explorer troop. We were hospital, so we did some volunteer work in the hospital and observed some things in the hospital. That was probably my first medical experience. Why I decided to go to Camp Oakhurst, well, it was slightly medical. The kids were physically handicapped, but also one of my neighbors [Carol Reisen] had been a counselor there and she talked it up. I decided just to try it. I decided to be a volunteer there.

**HATHAWAY:** That was the way to finally maybe become a counselor, right? As it turned out, it just happened a little bit more quickly for you because they needed you.

**RUBIN:** Yeah.

**HATHAWAY:** What was she talking up about? Maybe I can ask the two questions together. Why was this kind of Explorer club associated with the hospital? Again, already because of somebody like your friend's father or--?

**RUBIN:** Dr. Ediken might have been part of it. You know, he worked at that hospital. This was a way that I could go into the hospital and see things in the hospital that I was curious about and see what kind of place he worked in. My father also, as a dentist, was on staff at that hospital and did work in a clinic in the hospital once a week. So the hospital was close to the family. And this Explorer troop was available. Steve Ediken and myself both joined the troop together.

**HATHAWAY:** Was Steve also going to be a doctor? Or, again, maybe interested in being a Boy Scout or an Explorer?

**RUBIN:** I think Dr. Ediken actually got us into it. He was probably the one that told us about it.

**HATHAWAY:** He was like a real kind of substitute or second father or the role model that's not father that you kind of talked to--things like that. I guess a lot of us have that. You can't always talk to your dad, so there's your friend's dad down the street or that teacher at school or somebody. Do you have any contact with him still?

**RUBIN:** I did. I saw him a couple of years ago. It was at my parents' fortieth wedding anniversary party. We made a party for my parents and he was there and I talked to him there. We started crying and everything.

**HATHAWAY:** I guess also because of Steve, perhaps?

**RUBIN:** Because of Steve, yeah.

**HATHAWAY:** I guess there could be another reason. Well, there can be the emotional ties also other than death that can bring people to express themselves that way. I'd like to cover more of Camp Oakhurst before maybe we go back to Philly, if you'd like. Your neighbor talked it up. What is it that she talked up that made you say, "Oh, this is a good summer job, or a good experience"?

**RUBIN:** I don't remember what she said. She probably didn't say very much, because she is somebody that I also admired a whole lot. She was the older sister of a friend of mine that lived down the street. I admired her a lot. She was just another person that paid attention to us and didn't treat us badly or anything. I thought she was a neat person. I don't know what she said at the time that made me start volunteering. I probably didn't have anything much else to do. I might not have had a good job that summer, I guess. So I just decided to try it, and I immediately liked it because it was a camp with a lot of kids in it that really needed a lot of attention, wanted a lot of attention. I was immediately drawn right in by the kids because they needed a lot of help. The more people there to help them there, the better.

**HATHAWAY:** Now, these weren't kids whose families were paying for this camp out of their

own pockets, right? You said they were from New York City, so I guess I got the impression that—

**RUBIN:** Yeah. Maybe like 10 percent of the camp the parents had money to pay. I mean, there was a fee, but almost nobody had to pay that fee because it was all supported by a group called the New York Service for the Handicapped. The New York Service for the Handicapped received huge donations from I think something called the Federations [of Jewish Philanthropies of New York]. It's a big charity.

**HATHAWAY:** United Jewish Fund?

**RUBIN:** Yeah. Something like that.

**HATHAWAY:** I think it's an umbrella group for a lot of different-- Like United Way.

**RUBIN:** We always talked about it as the Federation, which was really the people that we depended on for giving money to the New York Service for the Handicapped, which in turn ran the camp. Almost nobody paid.

**HATHAWAY:** Can you tell us what was it like? You know, a physical description?

**RUBIN:** Well, the camp was-- It wouldn't be what you'd call a really beautiful camp in Maine. It didn't have big forests or anything like that. But for these kids it did. For these kids it was like going to the Rocky Mountains and taking a tour through the Grand Canyon. It really was like that for them, for the little ones. It was really basic campgrounds that had some trees, had these wooden structures, bunks, a small woodsy area that you could take walks into and maybe build a fire or something back there. There was a pool and there was an art room and there was an activity room and there was a theater for plays--for all kinds of activities--and there was a gigantic mess hall. So it was a really very basic, simple camp area. Of course it was all geared for the handicapped, with ramps and all the things that you would need as far as that goes. We had a bus where you could put wheelchairs on the bus and things like that.

All the kids had something wrong with them, but the kids were all very, very different. I mean, there were some kids that had no legs. There were some kids that were spastic. There were some kids that could just sit there like lumps because they had muscular dystrophy. There were kids with other diseases where their handicaps were secondary, like kids with hemophilia that had problems with their joints because they had bleeding into their joints over the years and their joints didn't work very well. There were just all kinds of kids there. There were kids that

were handicapped but were also retarded. There were kids that were retarded there. It was just this incredible array of--

**HATHAWAY:** I was going to say, kind of a catchall. If you were in New York City and you perhaps needed a situation where your child could get away from the city for a-- Was it the whole summer they went down there? Was it shifts?

**RUBIN:** They were called trips. They were two-week trips. Some kids got to stay for just one trip and some kids got to stay for two trips, which would be four weeks.

**HATHAWAY:** So they probably went through three-, four- week periods. Two maybe--

**RUBIN:** At least-- No.

**HATHAWAY:** I mean you, the people who would work there, the volunteers.

**RUBIN:** I think there were four trips, yeah. At the end of every trip there'd be a banquet night, where everybody went home. The end of every trip was this incredible emotional experience, because just in the two-week period was this intense experience for kids and counselors alike, where the kids got to trust the counselors and the counselors got attached to these kids. Part of it was because they were really deprived in their homes in New York. They didn't get a lot of attention. People didn't care about them. They didn't get out much. We just responded to that. I mean, because we were able to give them things. So at the end of every trip it was this emotional thing because neither one of us wanted to-- - We didn't want them to go back to New York City; they didn't want to go back to New York City.

So it turned into an all-year-round thing for me. We used to go to New York. Well, many of the counselors were from New York. I was one of the few people that was local. Most of the counselors were recruited by the camp in New York because that's where the organization was, but there were a few people that were local like myself. I would go into New York and we'd see the kids all year round. In fact, there was a program--which I couldn't participate in, because I never actually lived close enough to New York--where the counselors have assigned to them a kid. It was like a Big Brother/Big Sister-type program. That would go on throughout the year. There was always a Christmas party. And there were a bunch of kids that didn't live in homes. They lived in an institution in New York City called the Bird S. Coler Hospital, which is on what used to be called Welfare Island. No, wait, Roosevelt Island?

**HATHAWAY:** Yeah.

**RUBIN:** Yeah. So we used to go to that hospital and visit the kids that lived in the hospital. This was like a Geraldo Rivera exposé. This was a horrible place, and it was real. It was real, and going to see it was just unbelievable. I don't know how many times I went to Bird S. Coler Hospital. I've been there--

**HATHAWAY:** For like a weekend or just drive up for the night from either Deal or Philly [Philadelphia]?

**RUBIN:** Yeah. I had to take the Number 7 subway across to Queens. Then I had to take a bus which went some weird route and then went over this tiny little bridge onto the island and dropped me off at the hospital. Because these kids there really enjoyed seeing people.

**HATHAWAY:** Basically abandoned by families, do you think, and that's why they were--?

**RUBIN:** Some were definitely abandoned. At the beginning of each trip the social worker would give us a synopsis about each kid, what their medical needs were, if they had any, but also what their background was. Every single one of them had this social history that was hideous. It was really a traumatic experience.

**HATHAWAY:** What was the age group of the kids who were coming?

**RUBIN:** They were all school ages, basically from kindergarten through the end of high school. I always took care of the youngest. I was always with the five-year-olds. When I became a counselor, I was in the five-year-olds' bunk, and I stayed in that bunk throughout.

**HATHAWAY:** When you say you continued this into college and even into graduate school, you mean you went back and were a counselor for the summer?

**RUBIN:** Yeah.

**HATHAWAY:** At the same whatever lousy pay rate that I'm sure they were paying counselors. You weren't starting to go into some sort of an administrative position? Or I'm sure maybe you were head honcho or something when you were—

**RUBIN:** The summer after med school I wasn't a counselor. I worked in their infirmary.

**HATHAWAY:** And then you didn't continue that anymore after that?

**RUBIN:** And I had another job as well actually. I worked in a hospital, too, that was nearby. So I would work in the infirmary during the day. There were a lot of kids that needed enemas, because they couldn't have bowel movements otherwise. I administered the enemas.

**HATHAWAY:** That's a great summer job.

**RUBIN:** It was a lot of fun though, you know.

**HATHAWAY:** You could talk to them or--

**RUBIN:** This was like a club. We turned it into a club. It wasn't medical at all. It was a club.

**HATHAWAY:** Did it have a name?

**RUBIN:** It did have a name. I wasn't going to tell you. It was too weird. Never mind. Let's skip that for now.

**HATHAWAY:** All right. We'll just leave it for people's curiosity.

**RUBIN:** But we did. The kids felt they were in part of a club. And while their enemas were going into them, we would be doing things. We'd have activities and would do stuff, so that was fun too.

[END OF TAPE 1, SIDE 2]

[END OF INTERVIEW]

**INTERVIEWEE:** Charles M. Rubin

**INTERVIEWER:** Neil D. Hathaway

**LOCATION:** University of Chicago Medical Center  
Chicago, Illinois

**DATE:** 7 November 1992

**HATHAWAY:** I think we finished with Camp Oakhurst. We may come back to it as we get into some of the reasons why you've gone into pediatrics and the kind of work you've done as a pediatrician, as a research M.D. But I think we've pretty much covered it for now, and I'd like to move on to your undergraduate years at Penn [University of Pennsylvania]. We started talking about it on Thursday. You mentioned that you didn't really want to go to school in the city. Penn and Rutgers [University] were your safe schools, and those were the only two you got into, so you went to Penn. And now, at least, you're glad you did. I get the impression that perhaps that comment was you were glad you did and you realized that once you got to Penn as well. I would ask about what time it was that you realized that Penn was a good place to go, and why?

**RUBIN:** Well, I realized it pretty quickly. I really enjoyed it right away, because I enjoyed the people that I met there. I was immediately in a special dorm situation that was an experimental dorm, where there were a lot of opportunities for interaction. It was kind of an experimental, coed kind of dorm. The core group got very close and very friendly very quickly, and so I immediately was happy just being there. But I learned to appreciate the city over a longer period of time.

**HATHAWAY:** The city in general. I mean, generic city, metropolitan kind of cosmopolitanism? Or you mean Philly [Philadelphia]?

**RUBIN:** Well, I mean cosmopolitanism, and Philly also. I learned to enjoy getting on the subway and going places. There were some really special places in Philadelphia, like the historical area of Philadelphia, that were just exciting to go down to. I never really thought of the city that way, as having things that would be really enjoyable to go to, other than maybe museums. Because when we were children we would go up to Philadelphia, to the Ben[jamin] Franklin Institute, which was a science museum there. That was always exciting. But otherwise I didn't really see it as a place to be. I gradually learned how much fun it was to go around different places in the city and travel around in the city and do things and do that kind of independently. So that was really a lot of fun.

But then, also, over the years, I got involved with some activities that maybe wouldn't have been as easily available in a rural area. I used to go up to the Saint Christopher's Hospital for Children, which was way far away from the University of Pennsylvania. I'd take two trolleys to get there on Sunday mornings. I worked in their playroom department in the hospital. I might not have had an opportunity to do anything like that because in a rural area there might not be a children's hospital, for one thing, which was in itself an incredible place. I just wouldn't have had that opportunity. It was things like that that made me realize what a great place this was for me to be during my college years.

**HATHAWAY:** It wasn't so much, then, the academic program? Or how would you describe what you were doing academically?

**RUBIN:** The academic program wasn't, for me, really that exciting. I was premed at that point, early on.

**HATHAWAY:** Starting freshman year?

**RUBIN:** Yeah. I was thinking that I ought to take the courses that were related to getting into medical school from the very beginning. I don't really remember any of them as being really all that exciting--organic chemistry, chemistry. Some of the biology was kind of interesting. I know it was academically a very good place. There were some good people there. But I didn't think of being at the University of Pennsylvania as being outstanding other than for the reason that I learned to really enjoy Philadelphia and was able to take advantage of certain unique things that were in Philadelphia.

**HATHAWAY:** This experimental dorm you were in, it wasn't particularly for premed students or anything like that, right? It was just a residence hall that went coed to try to see if that was a viable operation?

**RUBIN:** Yeah.

**HATHAWAY:** What was your social circle like? Was it mainly with the people you met in the dorm the first year?

**RUBIN:** Pretty much. We were only in that dorm for one year. We all had to leave that area after the first year. We had a choice of going into a second very experimental group together or to just go off wherever we wanted to. We decided to go off wherever we wanted to, but we all

stayed friends. In fact, the year after that, for our third and fourth years, all ten of us got together again and rented an entire fraternity, what used to be a fraternity house. Ten of us--five women, five men--lived in a fraternity house on our own for the third and fourth year of college.

**HATHAWAY:** Were any of them couples?

**RUBIN:** There was an amazing amount of couple activity.

**HATHAWAY:** I mean, just switching? You mean back and forth?

**RUBIN:** Not really too much switching, no, but an amazing number of relationships developed just within the ten. We always talk about that situation.

**HATHAWAY:** Are some of them still intact? Or were there just mainly the college years and then people went on their--?

**RUBIN:** Well, I think there's two marriages. One I know for sure was a marriage, and they're still together. And another one, I'm pretty sure they got married. Dave [David Aptaker] and Sherry probably got married. But I don't know that for certain. I know that they were together for many, many years, and they moved to Boston and worked there. I think they got married, but I'm not actually positive. So there were actually some very close relationships in there.

**HATHAWAY:** Do you have any contact with any of them? Regular contact, even, you know, Christmas-card-type, annual, end of the year?

**RUBIN:** No. We don't have any annual contact anymore. I hear about some of them.

**HATHAWAY:** Reading the alumni news or something like that?

**RUBIN:** No. There's one person, whose name is Doreen [Morrow], who didn't end up living in that group of ten, but she was essentially real close with the group of ten. She lived nearby. I'm very close with her. I talk to her all the time. She actually is a pediatrician. We did some training together as well later on, so I know her very well. She knows a couple of the people and stays in contact with a couple of the people. Also, we had this flurry of activity about two years ago where one of the people in the group of ten wanted to have a reunion for all ten of us. It didn't

actually happen, because there were a lot of people that we couldn't find at all. There were several, at least four or five people out of the ten, that we couldn't find at all. We had no idea where they were and we just couldn't track them down. But there was an idea to have this reunion, which so far hasn't happened.

**HATHAWAY:** I think of that movie. I can't remember what it was called. Something with the word "chill" in it or something like that, right?

**RUBIN:** The Big Chill.

**HATHAWAY:** The Return of the Secaucus Seven. an earlier, cheaper version of the same sort of thing. You said you got involved in quite a few activities, and you mentioned the one at Saint Christopher's children's hospital, going on weekends. What were some of the other ones?

**RUBIN:** I also volunteered-- Well, see, initially I figured I'd probably end up going to medical school. But as I did more work at Camp Oakhurst, which was going on every summer throughout the college years, I started to think that maybe I'd prefer to go into special education, education for kids that have physical and mental handicaps. Many of the other counselors at Camp Oakhurst were in special education. Only one of them was interested in medicine. I thought maybe that would be the thing for me, rather than medicine, and so I started exploring that area. I volunteered at a place called the Home of the Merciful Savior for Crippled Children, which is a pretty horrible name. They don't give that name to places anymore. It was a residential home and school for kids with physical handicaps that was really close to the University of Pennsylvania. I would go over there, and I had more exposure to the educational part of these kids. I also had a similar experience at a school that was run by the United Cerebral Palsy [Association]. Again, it was more trying to get an idea of what it's like teaching these kids and getting them to adapt to their handicap and getting them to become independent. Those were the two key experiences like that. I ended up deciding that that wasn't what I wanted to do. It sort of reaffirmed that I really did want to go to medical school and work on the medical side of things.

**HATHAWAY:** Why? Just because teaching wasn't enough?

**RUBIN:** It just didn't seem like something that I-- I liked the kids, but I didn't necessarily like the idea of planning curriculum or necessarily carrying out the work.

**HATHAWAY:** And why was medicine now, I guess, even now, more appealing than it had

been before?

**RUBIN:** Well, I don't really know why. It was very exciting. Medicine was very exciting to me and gradually became more and more exciting. Going to these other places was much less exciting to me. I can't really say exactly why. There were a lot of things that were happening in the area that were exciting. It might just be a question of what role models were available to me. You know, the role models that were available in these schools were sort of bored teachers that were burned out. Whereas it might have been that if I met some teachers that were really excited about what they were doing, I might have followed that role model. But I ended up having role models that were in the medical side of things that excited me a whole lot.

**HATHAWAY:** You mentioned Dr. Ediken.

**RUBIN:** Dr. Ediken when I was younger.

**HATHAWAY:** Who were the others? Were there others when you were at college age?

**RUBIN:** Well, in college there were. There were two key areas. One was Bertram Lubin, Dr. Bert Lubin, who taught a course that I took in my second year of college at Penn in a sort of experimental college called the College of Thematic Studies. Did I tell you that already?

**HATHAWAY:** No, no, we haven't--

**RUBIN:** Well, in the second year we had an opportunity to take courses in this brand-new sort of department called the College of Thematic Studies. They had unusual courses in that group. I don't know the title of the course, but one was a genetics course of some sort. It was taught by a guy named Bertram Lubin, who is a pediatric hematologist. It was on genetics. What he did was he just used two examples of genetic diseases and made us understand those two genetic diseases completely, so that we understood the biological basis for the diseases, the clinical aspects of the diseases, how to treat the diseases, and what impact the disease had on families and people socially. He gave us the full spectrum of the two diseases. One disease was a disease that he treated all the time, which was sickle-cell anemia, which is a genetic disease. The other disease was Down's syndrome, which also is a genetic disease caused by a chromosome abnormality. His son had Down's syndrome; that's why he chose that one. He doesn't treat children with Down's syndrome, but he had a child with Down's syndrome. He felt that using these two examples he could give us this concept of what really good medicine could be like. That if you understand the whole picture of the family and the social impact, as well as all the medical aspects of it--

**HATHAWAY:** Was it a class for premed--?

**RUBIN:** No. There was no premed curriculum. You just had to take courses so that you could get into med school. But there was no such thing as a premed-- My major was in biology, but this was just an elective course that I took separately. It wasn't related to being premed or in biology. Anybody could take it.

**HATHAWAY:** Were there a lot of med students, premed people, in it though? People that you recognized from the--?

**RUBIN:** I honestly don't remember. I have no idea what the other students' goals were in the course. I would assume they probably were premed, but I can't really say that for sure.

**HATHAWAY:** This seems to have had quite a bit of influence on you, you know, just the course and him, I suppose.

**RUBIN:** Well, it did. He was an incredible person. He was very charismatic. We went into the Children's Hospital of Philadelphia, which at that time, when I was in my second year of school, was located at Eighteenth Street and Bainbridge Street in Philadelphia, which was a couple of miles away from Penn. It's a famous, old children's hospital that was started in like 1855. I eventually did my training there. I was there during their 120th anniversary. This was one of the first children's hospitals that ever existed. We were down there at one of their original buildings. We saw patients with sickle-cell anemia down there. It was a one-on-one situation. We didn't all go down there at once. I went down there by myself and went with him and saw patients. It was just an incredible experience for somebody that was nineteen or twenty years old and thought they wanted to go to med school but really didn't have any idea what medicine was really like. Just meeting him and seeing how he interacted with his patients and going to this incredibly famous, old hospital was a real big experience for me. He was a big role model for me, because he obviously had a very, very upbeat attitude towards taking care of these patients and was very dedicated and really enjoyed it. From that point of view, he was a real, real positive role model in terms of going into medicine, as opposed to going into the special education aspect of things.

That was one thing. The other thing that happened was that hospital built a brand-new facility during the time that I was in college. That facility opened in, probably, 1974, during my last year of college. I graduated in '75. It opened in the beginning of my senior year, somewhere around there. The new Children's Hospital of Philadelphia was located right at the University of Pennsylvania, right on the campus. And I immediately-- First of all, one thing they did very early on there was they separated a pair of Siamese twins in the first year that that hospital was

open, while I was a senior. This excited me tremendously.

**HATHAWAY:** I think I remember hearing something about it on the news, you know.

**RUBIN:** It excited me tremendously. I didn't actually want to separate Siamese twins myself. I just was very excited by what happened in the Children's Hospital. This is a picture of Dr. [C. Everett] Koop--who later became the surgeon general of the United States of America-- getting ready to separate these two Siamese twins. That also was a key thing for me, because to me at the time it just seemed so exciting and it was right there. Of course I couldn't see the operation, but shortly after the operation they gave an opportunity to go see in their auditorium a film where a lot of the operation was described and some of the tape from the operation was shown. I went to see that. Then, shortly after that, I found what turned out to be a geneticist there who I ended up doing research with, sort of helping him do his research.

**HATHAWAY:** Who was this?

**RUBIN:** Well, there were two different ones actually. I don't know all the timing. I worked with two different people. One was a guy named William Mellman. At the time he was a fairly prominent geneticist and pediatrician. He was studying chromosome abnormalities that you could find in amniotic fluid, you know, prenatal diagnosis of chromosome abnormalities, things like that, as well as many other things. I asked him if I could do some work with him. He had me fiddle around with some culture techniques, some really simple things in the laboratory. The only thing that was exciting about doing it was-- It was a little bit exciting fiddling around with the test tubes and so on. But it was much more exciting just walking into the lab, which was interesting, because to get to the lab-- His lab was actually in the University of Pennsylvania Hospital, which was next door. To get to it you had to go through the doors that go into the operating rooms. The doors say, you know, Do Not Enter, blah, blah, blah, blah, blah. But you are allowed to actually go inside the doors, and then there was this sort of cutoff hallway that went to where his lab was. It was just always exciting for me to go up there, because I was always looking around to see what was going on. It really excited me just being up there. I got to know some of the surgeons up there. I ended up going to see many operations and many, many childbirths while I was there.

**HATHAWAY:** And not fainting anymore. You told the story about fainting during that first surgery that you observed, I guess.

**RUBIN:** Yeah. I got over it somehow. I wasn't fainting anymore. I saw many childbirths--every single one of them was just, to me, incredibly exciting--and a fair amount of surgery as well, just by being up there. That was a really great opportunity. The research itself wasn't really

interesting. It didn't really go anywhere. We didn't publish anything. It was just a very minor thing. But it was really exciting getting to know these people and to have this opportunity.

And then later I did some research that was more interesting to me. This was the spina bifida chicken operation. In the new building, in the new Children's Hospital of Philadelphia, I started working with a guy there whose name was Tage Kvist. He had some kind of Swedish accent or whatever. He was working on spina bifida, which is also called myelomeningocele. He was using vitamin A to determine whether vitamin A was teratogenic. In other words, was vitamin A one of the things that led to spina bifida, or open spinal cord? There was some evidence to say that vitamin A could do that.

**HATHAWAY:** Like an excess of it? Or the body's not processing it properly? I wasn't sure just--

**RUBIN:** Well, no. Nobody really knew. But I think there were some observations about people who were taking vitamin A that had these babies, and so there was some evidence that it caused that. What we did was we took eggs--fertilized eggs, chicken eggs--and we would cut out a hole in the egg so we could see the embryo. We would inject vitamin A into the egg, and then we would let the embryo grow for a while and see whether the spinal cord closed over like a normal one was supposed to do or whether it stayed open. That was kind of exciting for me because, for one thing, it related directly to some kids that I knew, which were kids from Camp Oakhurst, many of whom had spina bifida. So it related to that. Also it was very visual because you could actually see the defect in the embryo. All you had to do was go to the simple microscope, look at the--

**HATHAWAY:** Low-tech kind of research, as opposed to the—

**RUBIN:** Look at the embryo, and you could see whether the spinal cord was fused or not fused. We would record on a piece of paper what the degree of the abnormality was. And of course vitamin A was something that I had heard of at least. It wasn't something weird. So I could relate to it in a lot of different ways. Plus, it was in the Children's Hospital of Philadelphia. I can tell you, just walking into the Children's Hospital of Philadelphia alone to me was extremely exciting. That's just the way I was in those days. So all of it taken together was a really great opportunity. All these things together pretty much compelled me to go to medical school rather than do something else.

**HATHAWAY:** I gather you kind of had a sense, just before you even got to campus, that that was-- Again, how sure we are when we're seniors in high school is open to question. But you had some idea of medical school already because, I guess, of Steve['s dad, Dr. Ediken].

**RUBIN:** Because of Dr. Ediken and because of the Explorer troop.

**HATHAWAY:** Do you know why--? I mean, you also mentioned that your brother [Richard J. Rubin] went into teaching children who were deaf. I see some similarities between your interest in children and your brother's. I'm wondering if you have-- And I don't want to get into some sort of psychological explanations or anything like that, but why the interest in children who need extra help? And to kind of cover your brother as well. Have you ever given this thought as to something in your upbringing or things like that that may explain or have some bearing on your--? Again, this seems like a young age for your typical, average American guy going to Penn medical school to be thinking about helping children, as opposed to going into dermatology or plastic surgery or something like that.

**RUBIN:** I don't know. I mean, for me, it was the only thing concrete that I knew about. I can't say anything about my parents [Benjamin and Byrnece Rothauser Rubin] that would have directed me that way. As far as I knew, they cared about all people. And also I knew my father really enjoyed being an orthodontist, which meant that he really took care of children.

**HATHAWAY:** He was taking care of kids, right. You said that.

**RUBIN:** All of his patients were children, and I knew he really enjoyed that. But these were normal kids. I think the Camp Oakhurst experience was really powerful, and the experiences with Bert Lubin at Pennsylvania, seeing the kids with sickle-cell anemia, meeting his own child with Down's syndrome, were incredibly powerful. I know that they were because I can remember them clearly, whereas there's millions of other things from that time period which I can't remember at all. So I know that they meant a lot to me at the time.

**HATHAWAY:** Do you know what that kind of powerful feeling was? I mean, did you bother to kind of sit back and try to analyze it or give it some, again, not psychological analysis, but just to kind of figure out why, what was so striking about this experience, as compared to so many other events in your life? Or was it just something that really wasn't really explicable in those kinds of terms? It just was that way and so you kind of went with it and pursued it.

**RUBIN:** Yeah. I can't really say. I mean, I can only guess. It was just the-- Well, an example is when I went to Saint Christopher's Hospital for Children, which I did my first year of college, and took those trolley cars up there to work in the playroom. They would put me in-- One of the things that was kind of my specialty was to go out of the playroom into the rooms of the kids that couldn't come into the playroom. They had a big burn unit here. I would go into rooms where kids were isolated in a single room because they had severe burns. My initial reaction

was, “Well, I can’t do anything for this kid. I can’t even look at them, much less do anything for them.” But as I did it, you realized how much effect you had on the child by going into the room and playing Monopoly with them. There were things that you could do for these children. It made me realize, “Oh, my gosh, I really did something that helped that child have a better day.” That’s very satisfying. Just the process of going through it and learning that it was so satisfying compelled me more and more to want to do more of it.

**HATHAWAY:** To jump ahead just for a moment, would you characterize the reasons you’re still in it as the same? In other words, are these the basic response of “See, I’ve accomplished this much”? I mean, are these kinds of feelings still going on today? Is it pretty consistent? Because now that’s, what-- I’m trying to think, ‘70-- We’re talking almost a quarter of century. That’s a pretty good-- You did your med school, I guess, in three years, four years, at Tufts [University School of Medicine]? Why Tufts?

**RUBIN:** Well, it was common to apply to ten places. I think that was the maximum that you could put on your automatic-- You know, you could fill out one application--

**HATHAWAY:** Whatever those tests are too. You know, send them out for a fixed fee or something.

**RUBIN:** I think if you went over ten, then you had to pay extra. I think I applied to the full ten. This was the peak of competitiveness for getting into medical school in that year. I would say that was the absolute peak. It’s a little bit easier now, and it might have been easier before that. But it was the absolute peak. The entire psychology of the whole country was directing everyone to go into medicine.

**HATHAWAY:** I remember. I was at Georgetown [University]. I started in ‘77, and [it was] still pretty bad. I mean, clearly, in the four years that I was there, you could see that things were getting a little bit less tense among this huge contingent of premed students at Georgetown. They were a driven and crazy lot of people.

**RUBIN:** So I applied to the full ten places. I really liked Tufts. Boston I really liked a lot. And the school itself was not scary to me at all, whereas you might think of going to Harvard Medical School as being kind of scary. Well, this wasn’t scary. It was a rundown old clothing factory that was turned into a medical school building. I wasn’t nervous about it in that way. Maybe that might have attracted me to it. Just talking to the people there, they seemed like they were somewhat liberal or progressive in the way they chose students. There was a guy in our class that was thirty-eight years old, and there were a lot of women in our class and all those kinds of things. They seemed like they were kind of ahead of the game in terms of opening up

the school to various different kinds of people and to people who had already been working for a while and all those kinds of things. And it seemed like a real comfortable place to be, a very accepting place to be. At the same time, it was academically-- The hospital, which was called Tufts New England Medical Center, was considered to be a top academic institution. So it attracted me a lot. Boston attracted me a lot. And I just decided to go there.

**HATHAWAY:** Again, with the purpose in mind of--I know you do so much specializing--doing pediatrics, right, and coming out with that as a specialty?

**RUBIN:** Yeah. As far as I know I was always interested in doing this so that I could take care of children.

**HATHAWAY:** But Tufts didn't have a particularly good, you thought, pediatrics training, as opposed to other places. It was the medical school as a whole and, again, its attitude toward training doctors--

**RUBIN:** Well, they did have a really interesting children's hospital there. It was small and nothing compared to the Children's Hospital of Boston, which is at Harvard. But it was a small, interesting place called the Boston Floating Hospital. It had an interesting history to it. It was a very comfortable, small place. I think that might have attracted me for some of those reasons as well.

**HATHAWAY:** For the record, where were some of the other places you applied? Or do you have no idea? I mean, there was no choice. Once you heard yes from Tufts, you just went to Tufts?

**RUBIN:** I know I had gotten four acceptances. I don't remember getting any rejections per se other than University of Pennsylvania, which didn't interview me, which I was very upset about, because I was there. I loved their medical school. I loved the Children's Hospital of Philadelphia. I loved the medical environment there. I knew the people there. I had letters of recommendation from the people there. I was summa cum laude, which you can't really do any better. I had the best possible grades. I couldn't understand why they wouldn't interview me, and that really frustrated me a lot. I couldn't understand that. So I was essentially rejected from the University of Pennsylvania. Other than that, I got a bunch of acceptances. When I got the Tufts acceptance, I just dropped out of everything else. But I can't remember. I applied to a lot of top places. I applied to Northwestern [University] here in Chicago, which was, I think, the only place in the Midwest. And I applied to Yale [University]. I can't remember. I applied to a lot of top places.

**HATHAWAY:** But once you heard from--

**RUBIN:** When I heard from Tufts, I decided that this sounded fine.

**HATHAWAY:** You did so well academically as an undergrad. As you said, there's no set premed curriculum. Although I'm sure you kept running into the premed students in many of the same classes. As you said, there's a regimen of biochem and biology and mathematics and all sorts of other things. And then you're supposed to be well-rounded, so you take literature. If they didn't much interest you, what made you get such good grades? Was it just easy? It was a snap? Were you struggling to get these good grades? I guess I've kind of backed up to Penn. Again, I know I'm kind of running out of sequence here. But it just seemed interesting to me.

**RUBIN:** No, I studied pretty hard to get the good grades. I wouldn't say it was easy. I also did enjoy it. Chemistry certainly wasn't exciting; mathematics wasn't exciting to me. I placed out of mathematics, and I never took a mathematics course in college. I mean, I enjoyed it. I liked doing the little problems. I think there were problems in chemistry that you had to do, and I liked doing them and figuring out the answer. I seemed to be able to do it without too much trouble. So I enjoyed it. It just wasn't major exciting. Biology was pretty interesting.

**HATHAWAY:** What was the curriculum? What kind of courses did you take that excited you or interested you?

**RUBIN:** Well, again, even in biology, since I don't remember them very well, it's hard to say. There was one course I remember which was called neurobiology, which was a special course, a relatively small group of people. We talked about all the experiments that were done over the years to understand how nerves conduct information. That was really exciting. It was very, very interesting, and I remember the course. I remember the teacher and all those sorts of things. But in general it's all a blur. I think that's because it wasn't overly exciting. It was relatively easy. It was not unpleasant for me at all. I enjoyed it adequately enough that I'd spend the time to do it, and I didn't avoid it.

**HATHAWAY:** Again, you spent four years-- I guess it's typical, right, four years med school, three years?

**RUBIN:** I just went through the standard program, four years of college, four years of med school.

**HATHAWAY:** Is there anything you wanted to talk about about med school and Tufts other than what we've already covered and its attitude toward training doctors being perhaps a little bit different or a little bit more progressive? Did anything strike you about--?

**RUBIN:** Well, I loved medical school. I loved it. It was fantastic.

**HATHAWAY:** Then I guess we've got a lot to talk about.

**RUBIN:** Well, I don't know if I can even say why. I just loved it. It was fantastic. Anatomy was incredible. Everything. It all was fantastic.

**HATHAWAY:** You're my first M.D. for interviewing. I will admit my focus has been on trying to get a grasp of more the social aspects of preparing myself and those sorts of things. Ph.D.'s, while they're in medical schools, more often than not, they're in a different world than the med students. So I have very little background. I have a sense from my own experience with being at graduate school and knowing med students and knowing people who were doctors--but that's all very ad hoc--that a lot of people hate med school. And med school is the boring part. It's the residency. It's the internships. It's the actually, finally, after all these years, being able to practice medicine that people look forward to. So I guess I would say that I find that to be a kind of opposite. Your reaction would be different or out of the ordinary. You loved anatomy--

**RUBIN:** Well, I felt that way too. We just couldn't wait for them to let us loose on the wards. There is no question about that. As a medical student you were held back. Other people would do the critical things or the interesting things, and you kept thinking, "Gee, I wish I could do that, I wish I could do that." There was that feeling in medical school. The first two years of medical school is the basic sciences. You're in the classes, and it's very structured. But I really liked the material. The material is fantastic.

**HATHAWAY:** You mentioned anatomy. I mean, that's the class that everybody hates, right? And you make jokes about your dead cadaver--well, that's being redundant--and name it and all these hideous things I've heard of from, again, med students I've known through the--

**RUBIN:** We named our cadaver Pearl. And we made up stories. We thought we knew about her whole life. We made up a whole life for her. She was a prostitute. She abused her body. But we really liked her.

**HATHAWAY:** But you enjoyed the class too.

**RUBIN:** The structure of the class-- There are four people standing around and struggling with the course material. The camaraderie of it was really outstanding. There were maybe 150, 100 people in our class, I think it was. Somewhere between 100 and 150. You get to know all of them, and you get to know all of their quirks. In some ways I'm sure other people would find it really unpleasant--because everybody knew everything about everybody else and that sort of thing--but my view of it was that it was just an incredible group of people that were all different and were all fairly interesting. You'd get to know them all very well over a four-year period. I just enjoyed it a lot.

**HATHAWAY:** Besides the anatomy class, as you said, the first two years were the basic science classes. It was all still pretty much very structured. What were some of the other classes that you felt you were learning a lot from or may have had some influence on what you've ended up doing?

**RUBIN:** Well, anatomy was the highlight in the first year. The second year we went through the systems. So we went through the cardiac system and the GI [gastrointestinal] system, etc. We went through systems. Each month we had a new system. The people that taught those systems courses were usually the clinical people that were involved in those fields. We talked about the diseases. We talked about the physiology of these organs that were involved. But we also talked about the diseases that were related when the physiology went wrong. The people that were talking to us were doctors. It was just fascinating. It was just really interesting to see what happens when things go wrong and how you can put it back together. That whole year really had very little to do with my interest in pediatrics and so on. It didn't really influence me that way. But it did feed on my interest in diseases in general and how things went wrong and how you could fix things and so on.

**HATHAWAY:** What about the basic science courses? What about like the biochem? Were you taught genetics and molecular biology, or was this--?

**RUBIN:** Yeah. Molecular biology was really crude in those days, but it interested me. Everything interested me. The way I was in those days, everything, everything was great. I was euphoric all the time. But I don't remember anything special about molecular biology. It was okay. It was kind of interesting. It didn't have anything to do with me actually getting back into molecular biology, as far as I know.

**HATHAWAY:** It just was an intense kind of almost isolated experience in your life? As you said, people from the outside might come look in and go, "God, how can these people live like

this?" But from the inside, just looking inside, as you said, it was a very kind of almost complete experience?

**RUBIN:** It was fun. It was fun intellectually. It was fun socially.

**HATHAWAY:** Where does your interest in academic medicine come from? Was the experience at Tufts any indication for you that you wanted to be in academia as well?

**RUBIN:** Yeah, I think so. I think that probably had something to do with it. Because we trained in hospitals that were academic, and I admired the teachers that we had and their ability to take a problem and to be able to synthesize all the literature and all the information that's available in the literature to date and apply that to the patient. Rather than just, you know, "Well, your patient has a strep throat. We'll give them penicillin." It wasn't like that. It was, "The patient has a strep throat. Well, there's a recent article in the literature that says that you really don't have to treat strep throat, because within the first few days-- It doesn't make any difference when you treat it, as long as you treat it within--" You know, there is all this additional information, and maybe one understands more about the problem. I think I learned to enjoy that a lot as the standard of how I wanted to practice medicine.

[END OF TAPE 2, SIDE 1]

**HATHAWAY:** I have one kind of question more about the social aspects. How were you supporting yourself? Scholarship? Parents? Loans?

**RUBIN:** My parents. No, my father, from the day I was born, from the day all of us were born, he saved enough money that we could go to college. He saved the money so he could pay for it outright, and money for graduate school. He had enough that we could all do that. He dedicated his entire career, from the day we were born, to make sure that he saved for that event, for those events. So we didn't have to pay anything. And we were lucky, because it was right before-- When I went to medical school it cost \$4,000 or \$5,000 a year, and then within two years after I graduated it was \$12,000 a year. So I really just got in before it was necessary to--

**HATHAWAY:** Sell your soul.

**RUBIN:** Yeah. We would have had to have taken out loans and things. It's kind of crazy. But I just came in just a little before that, so I'm real lucky from that point of view.

**HATHAWAY:** I wonder if it's affected much how or who becomes an M.D. nowadays and whether it's changed how medicine is practiced, not only taught. That's a question we can talk about later when we talk more about the more general things related to being a doctor or something like that. I really know very little about how one goes about deciding where one's going to go after that for a residency or internship--which comes before which--and whether there's exams beyond passing classes and getting graded in classes. I know there's boards and things that come later with more training in specific fields. But I guess the way to ask a question or to ask the question about this is, again, how did you end up where you ended up, which is at Philadelphia Children's Hospital? Or maybe I'm skipping a whole thing you want to talk about.

**RUBIN:** Not really.

**HATHAWAY:** A specialty or--

**RUBIN:** Medical school was really fun, but I had already decided about pediatrics, and everything I did reaffirmed that during medical school. I knew I wanted to go to a really good program. I don't know how I had an awareness, but I knew which were the good children's hospitals. I had advisers, as well, in school that would help me figure that out. But during my fourth year of med school I did electives at three different children's hospitals. Two of them were in Philadelphia. I did an elective in nephrology at Saint Christopher's Hospital for Children, which is where I had been working in the playroom years before. I did that because I had a connection with that hospital. I thought it was a really neat place, and I wanted to go there, spend a month there, let the people there get to know me, and then apply there for residency. I also did a month at the Children's Hospital of Philadelphia. I did two months together in Philadelphia. And at the Children's Hospital of Philadelphia, which is called CHOP--everybody calls it CHOP--I did an infectious disease elective.

I also, somewhere early in my fourth year, went to New York [City] for a month to Bellevue Hospital. I worked on their pediatrics ward. I don't even know why I went there. I have no idea. I don't think I had any intention of going there for a residency. I did apply there for residency, I'm pretty sure, but it wasn't my intention. I think I wanted to go there just because I wanted to get the most radical inner-city pediatrics experience that I could. Well, of course, I knew many of the kids in New York from Camp Oakhurst, and it gave me an opportunity to be with some of my friends from Camp Oakhurst. That may have had something to do with it. But I don't know. I heard that Bellevue was city hospital. I just said, "Well, I'm just going to go there and enjoy myself and see some real inner-city health care problems." That's exactly what happened there. It was really wild, a really, really wild type of medical environment. You know, we're talking about patients that have no support system, come from really bad families and so forth, and come in the hospital with various problems. I got the experience of seeing how to deal with that situation.

**HATHAWAY:** It sounds like something you decided to go into in kind of a permanent way, though, right? I don't know who you're serving here, for instance, in Chicago. I mean, I'm staying over near Rush Presbyterian and Cook County [Hospital], and I assume that that's probably the places in Chicago where those kinds of--

**RUBIN:** Those are the same. Down here is the same. University of Chicago provides dollarwise more charity care than any other hospital in the city. It's the same. We're the same as Cook County. I mean, Cook County is a county hospital, so it's real radical there. But it's the same. We're a very tiny little island that's in one of the major ghetto areas.

**HATHAWAY:** Right. I noticed as I've come down here.

**RUBIN:** In addition to that, people come here from all over the world for specialized stuff. But it's pretty much the same.

**HATHAWAY:** Also at Children's Hospital in Philadelphia, and I would assume not so much in Minnesota. But perhaps I'm just not aware of what goes on at the University of Minnesota.

**RUBIN:** Yeah. Not so much in Minnesota. Minnesota was more poor people coming from rural areas into the city for treatment for cancer.

**HATHAWAY:** You say you applied to Bellevue for residency, and you applied obviously to Children's Hospital in Philly.

**RUBIN:** So I had some experiences in my fourth year which helped me decide where I wanted to go. It was clear, it was obvious to me, that the Children's Hospital of Philadelphia was where I wanted to go. I went through the ranking business, and I ranked all my hospitals. Children's Hospital of Philadelphia was my first choice, and that's where I got into.

**HATHAWAY:** I had already asked you about academic medicine, and you kind of decided that you were leaning toward that. That interested you rather than just being a GP [general practitioner] or a pediatrician with a practice in Deal [New Jersey] or something like that. When did you become interested? I know from your CV that-- I'm trying to place your first publication, and I think it perhaps dates back to Philly. If I can find it-- In 1985. So, yes, right, that's when you were-- No, no, you were in Minnesota by '85. I'm sorry. You were there by '82, weren't you? I was just wondering when you were interested in kind of pursuing, I guess,

some of the prerequisites of being an academic M.D., which is to publish, which is to conduct some sort of research, not necessarily molecular biological research but the epidemiological research, those sorts of things. When you got interested in that, was that at Philly? Or does one have time for that when one does a residency? Is that something that's supposed to come later? Again, I'm very vague on how these things--

**RUBIN:** Some people do it earlier, but usually you do it later. You're too busy in your residency to do it. In the beginning of the Children's Hospital, I was thinking, "Well, gee, I'd like to do primary care for inner-city poor people." Or I wanted to take care of handicapped kids because of my experience at Camp Oakhurst. In October of my first year at the Children's Hospital of Philadelphia was when I went through the oncology ward. That changed what I was going to do. I sort of forgot about the kids with handicaps, and I thought that these kids were just incredibly-- People say about kids that have cancer that they seem a little bit precocious. They've gone through all this stuff. They know about all these fancy words--"chemotherapy"-- and the names of their drugs and the names of all their different complications. They know a lot about medicine and things like that when they're just tiny little kids. But they're really neat. They're really interesting kids because of the way they've adapted to their situation. I was very attracted to the patients. That started me on the road to deciding I wanted to go into oncology. I just went through the three-year program in Philadelphia, and I decided that I did want to pursue that. I just decided, "Well, I've got to do something. I've got to pick something. I can either pick handicapped or oncology. Or I can say I'm going to go into some kind of primary care in the inner city or whatever." I just said, "Well, I really, really liked my experience on the oncology board. I think I'm going to go ahead and study that subspecialty."

**HATHAWAY:** And that's what one does when one's out of residency. In residency you're really required to cover all the areas, in other words, in some sort of rotational situation.

**RUBIN:** Yeah.

**HATHAWAY:** And perhaps, you know, the last year of your residency can be in this area that you're more particularly interested in. I don't know how that works as well. It's all split evenly among whatever the rotations, however many there are, probably six or something like that, right? Or maybe just three?

**RUBIN:** There are twelve, because there's twelve months. You work in the emergency room, which is seeing everything. You work in intensive care, which is seeing everything. You work on oncology, which is special. Then, in that particular hospital, the rest of the different areas were just divided up by age. So you work with newborns. You work with preemies [premature babies]. You work with babies. You work with regular little kids and adolescents. There was a ward for adolescents. So you rotate through all the different ages, but you see all the different

diseases. Oncology is in particular different, because many hospitals have that as a separate ward.

**HATHAWAY:** You mean pediatric oncology, not just oncology.

**RUBIN:** Yeah.

**HATHAWAY:** Is that how they did it at Children's Hospital, was to have the separate oncology ward regardless of age or something like that?

**RUBIN:** Yeah, regardless of age.

**HATHAWAY:** I've noticed that in the literature--yours and, I guess, the citation of others--that childhood cancers are treated pretty much as a group. In other words, up until adolescence and even up until eighteen, nineteen years old in some cases. I don't know if this is the place to ask such a question. We're moving into an area in which my background is quite slim. I just hope that in my asking questions which may seem basic to you that you're willing to answer them, because people will also be able to get a sense of how someone who's a specialist in the field can explain and make someone who's a complete nonspecialist in the field understand and give people who come back and read this many years from now an idea of your view on things at the particular time and with the particular work you've done. What specifics are there involved in separating out childhood cancers from adult cancers? What are some of the criteria or reasons for doing that and treating it as a different area?

**RUBIN:** Well, I don't know. Pediatricians and pediatric subspecialists take care of children, and internists and internal medicine subspecialists take care of adults.

**HATHAWAY:** So you just think it's a matter of just how things in medicine have developed generally. I guess what I'm asking is, do you find that you really need a different kind of knowledge and have a different kind of experience, as somebody who treats children who have cancer, as opposed to somebody who would be treating adults who have cancer?

**RUBIN:** Yeah. Well, you just have to know--

**HATHAWAY:** Because kids are different.

**RUBIN:** Kids are different sizes. There's differences as they develop in terms of their metabolism and everything. There's not a single cancer that kids get that adults get. This is a totally different field, except for leukemia. Kids and adults get leukemia, but otherwise, basically, everything is totally different.

**HATHAWAY:** Totally, okay.

**RUBIN:** I mean, adults get breast cancer and colon cancer and ovarian cancer. Kids never get breast cancer or colon cancer or ovarian cancer. Kids get a Wilms tumor, which is kidney, and retinoblastoma, which is of the eye, and neuroblastoma, which is of the nervous system, and no adults ever, ever get any of those cancers.

**HATHAWAY:** And that's mainly because their nervous system is pretty much developed and the cells are not in the process of changing and therefore not as capable of being transformed? I mean, is this why? And yet there are other kinds of changes.

**RUBIN:** Well, nobody really knows. There's probably some cells that are in children that aren't there anymore in adults, cells that are susceptible to becoming malignant. By the time they're adults, most of the cells have gone away. They're just vestiges from embryonic life.

**HATHAWAY:** Or they're set in their ways and they won't be changing or dividing or acting as the source for other, newer cells.

**RUBIN:** So it's a different field. But that's true for all the subspecialties. You know, pediatric-pulmonary people take care of children with lung disease, and then internal medicine-pulmonary people take care of adults with pulmonary disease. The same thing is true for all the subspecialties. Basically, it's just divided.

**HATHAWAY:** Certainly for cancer, it's not an issue of convenience or you treat little kids because maybe you also have some training in how to deal with little kids. It has to do with their bodies and the vast differences, I guess. Because, as a lay person, I think an infant who's six months is going to be as radically different from a child of eight as an eight-year-old from a thirty-five-year-old. I guess I'm wrong. Maybe that's just a commonsense thing that's not very sensible, I guess.

So you made your decision at Children's Hospital to kind of specialize in childhood cancers, and maybe we can even be more specific. Maybe you'd kind of narrowed in on which

kind of cancers you were interested in or something like that. How much did you learn there as a resident that you were going to pursue with research? Or is that part of the decision-making process that you had then?

**RUBIN:** I didn't really have any interest in research. There wasn't anything about it. I just had the approach that I enjoyed taking care of these kids and I got satisfaction out of taking care of the problems that they had.

**HATHAWAY:** So your experience in the oncology rotation, pediatric oncology rotation--or it's probably called hematology/oncology, right--at Children's Hospital didn't prepare you or didn't make you see that there were certain areas that you definitely wanted to tackle when you went on to the next chapter of your life, that sort of thing. And ending up at [University of] Minnesota was a-- The decision to go there was made for other reasons than there's somebody there doing this kind of research on childhood leukemia or something like that?

**RUBIN:** Yeah. That wasn't really the reason. I knew that I'd have to do research as part of my training if I was going to go into oncology. Part of the training program is that you do some research. To me it sounded fine, you know, it sounded like a good idea. It's part of the training. They're telling you that's what you're supposed to do. It sounded fine to me. But I didn't have any particular set goal, that I wanted to discover the cure for cancer, discover the cure for a particular cancer, or try to understand anything. I just wanted to learn how to take care of these patients. That's all. I knew that I was going to be doing some other stuff, and it sounded kind of interesting to me. But that wasn't what I wanted, and I wasn't--

**HATHAWAY:** Before we move on to Minnesota, is there anything else? Again, I don't like to close things off before you've had a chance to maybe talk more about Children's Hospital or any particular. We've also tended to neglect completely any aspect of a social life you might have. I know that you almost certainly had met your wife [Gretchen Gearhart Rubin] here in the Chicago area. You have only been married, let's say, three or four years. So I'm not jumping, you know, I'm not missing something in that sense. Were you just basically being a med student and being a resident for these--? We've covered, I think, seven years, without really talking about whether you were able to go surfing at all or something that happened in your family history or life that was of earth-shattering importance or something like that.

**RUBIN:** No. Really nothing in the family at that point. The residency was even better than med school. Now we had it down to twenty people in my class and getting to know them. We really got along really well. We had a great group. Five or six of us rented a house in Avalon, New Jersey, every summer, and we would drive down there on our weekends off. That was really fun.

**HATHAWAY:** It's a great place, cooler by a mile. I used to go there spring breaks and it was colder by a mile.

**RUBIN:** So we had a lot of fun down there. We had a great group. I'm very close with several people from my residency to this day.

**HATHAWAY:** Well, what are they doing? And briefly even mention their names.

**RUBIN:** Well, Doreen, who I mentioned before, Doreen Morrow I met on the first day of college at the University of Pennsylvania. We were friends throughout college. Then she went to a different medical school than I did. She went to Hershey Medical School, and then she went to a different pediatric residency program than I did. She went to Baylor [College of Medicine] in Houston, Texas. In her first year of residency, her mother was dying of breast cancer. She decided that she wanted to get closer, back to her mother. I had been talking to her, and I told her there was going to be an opening at Children's Hospital of Philadelphia for the second year of the residency, because one of the people that we had was leaving unexpectedly. I told my superiors about her and that she was a great person and that we should get her to fill this place because she wants to be here. And of course she knew Philadelphia. She got that job and she came up. And so the second two years of the residency I was back together with Doreen again. We'd been friends all along. But also the people that I met in the residency program included Andrew Costarino--I was the best man at his wedding exactly one year ago--and Mike [Michael] Spear, who's now-- Andrew Costarino is still at the Children's Hospital of Philadelphia. He's in the intensive care program at Children's Hospital of Philadelphia.

**HATHAWAY:** Is that an academic affiliation with Penn, as well, that he has?

**RUBIN:** Yeah. And just a lot of friends. Mike Spear is the other close friend, who is a neonatologist in Wilmington, Delaware. Then a lot of other miscellaneous people. But those two guys I keep up with very closely, and Doreen I keep up with very closely. Again, socially, it was a great, great three years. You know, there's always a girlfriend here and there.

**HATHAWAY:** Do you want to talk--?

**RUBIN:** Well, I mean, I don't know what to say. You know, I did have--

**HATHAWAY:** I mean, your first love, and it ended tragically, who knows? There could be a

great soap opera in here, or is there just something nice and kind you wanted to say about somebody? I don't know. It doesn't always have to have something to do with medicine and research. This interview is kind of what we call a modified life biography. So if there's again somebody special you want to talk about-- Or somebody you especially want to avoid because your wife is going to be reading this, then we'll move on.

I do have a note from you. You were the first to actually send me a list of things that I should remind you of, and I don't know if I've been very good about it. Dougie at Children's Hospital. I don't know if that's a patient or--

**RUBIN:** Yeah. He was a patient on the oncology ward. I don't know that I really need to talk about him. He was a really cute little three-year-old whose parents never came around to see him.

**HATHAWAY:** Let's turn this off for a second. [tape recorder off] Now you've got my curiosity piqued. Why did you bring him up on a list, send his name to me on a list of things?

**RUBIN:** Well, he was just one of the cute little kids on the oncology ward that I spent a lot of time with. I learned how to deal with his disease and learned how to deal with the fact that he had to get needles stuck in him all the time. He became very friendly with the staff that were there. I don't really know how to put it into words. He's just somebody that I remember very clearly who affected my decision to go into oncology. But he was just a three-year-old little boy who I spent a lot of time with. Again, my interest was just because these kids were so cute, more than because I wanted to make a medical breakthrough or something. That's how I got into it.

**HATHAWAY:** I don't know. Maybe this is something that occurred to me, and I don't know that it's something that you want to pursue. Now you have your own family. And again, this is a recent thing. I would assume that in many ways people in your situation, M.D.'s, tend to maybe start families later. I know they start them perhaps later than most people, because of the immense amount of intense work that's required, the difficulties in doing that with the family too. We've already kind of talked about the issues now as they face you at this stage of the game, and we will talk about them later. But do you see any correlation between your work, which is with children who are sick, and either, one, perhaps not having a family or not settling down earlier than might be expected? Perhaps I'm being really out of line in suggesting that you're supposed to have done this by a certain time or something like that.

**RUBIN:** You mean if I had a family, I wouldn't have gotten so close with Dougie? Is that what you're saying?

**HATHAWAY:** Or the other way around. I'm just curious as to how you look at your own children now. You have your three daughters, but one is a stepdaughter [Elizabeth Kathryn Flock] and one is one year old [Lucy Anne Rubin] and one is two [Jane Sonia Rubin]. I'm just curious-- Here's your life in dealing with very sick children, and here you have your own children. I'm just wondering whether you're aware of-- You know, most fathers, I don't think, probably have these kinds of connections or other things going on in their life that make them so aware of children and how maybe susceptible they are to harm and things like that. I'm just curious as to how maybe you feel about your own children now or about an explanation as to why maybe it's come at this point in your life as opposed to earlier. Is this all just mumbo jumbo to you that I'm driving at?

**RUBIN:** I don't know. I got married--

**HATHAWAY:** You just met the right person and that's the right woman and that's what happened.

**RUBIN:** I guess.

**HATHAWAY:** It doesn't really necessarily have anything to do with your work and--

**RUBIN:** It might be that I felt like I wanted to make sure that I was going through my training fully and I wasn't able to make a full commitment to getting married in the middle of that. I really don't know.

**HATHAWAY:** I may be reading my own kind of fears about having children or something with the situation of constantly seeing and being with children who are very sick. I mean, I guess I would just put two and two together and be very wary, I think. I don't know. But, again, maybe that's injecting myself into somebody else's life as opposed to--

**RUBIN:** It's not a big thing for me. I'm really relaxed about their medical situation. If anything is wrong with them, they go to some pediatrician.

**HATHAWAY:** Right. You don't interfere in that part of it or whatever. That's not your area or something like that, except as a father. I mean, not as a doctor.

**RUBIN:** Yeah. I don't know why. Some people might get really anxious about their children's

health because they know so much about children that are sick, but I don't feel that way.

**HATHAWAY:** I suppose that's probably not a common thing among doctors. Who knows? I mean, there are plenty of doctors with families so--

**RUBIN:** Yeah. I think you just block stuff out and have a lot of little defense mechanisms so you don't think about it too much. Every once in a while it invades your consciousness, but most of the time I'm pretty relaxed about it. I'm not really overly concerned that they're all going to get leukemia or something. You know, every once in a while you think about things like that, but it doesn't affect--

**HATHAWAY:** I guess I'm kind of thinking that here I am doing all these oral histories, and you'll never, never get me on the other side of the microphone. That sort of thing is, I guess, what I'm wondering about and wondering about your feelings concerning that. But, as you said, maybe the best and easiest answer is that, well, you don't. You separate the two out. So that's set up so you can be the father and be the professional. Is there anything else? I think we covered even the part that you wanted to about what you asked me to remind you of in Philadelphia. I guess I would just go on to ask you how it came about that you ended up at [University of] Minnesota for your next--? Because your title was clinical fellow. This is called an internship or something along those lines?

**RUBIN:** No, no. I didn't take an internship. An internship usually means that you're rotating through all the different areas in medicine, like surgery, medicine, pediatrics. But I didn't take an internship, because I knew I wanted to go into pediatrics. So I just did a pediatrics residency. And you don't have to take internships anymore. Then after that your subspecialty training is called a fellowship. That was what that was. I was taking a subspecialty pediatric hematology/oncology fellowship, which was a three-year program.

**HATHAWAY:** And why at Minnesota? Just, again, a good program?

**RUBIN:** Yeah. I always wanted to be in the best program.

**HATHAWAY:** So that doesn't matter where it is or who it is.

**RUBIN:** Not that Tufts was the best medical school in the country, but it was certainly good. But I wanted to be in the best pediatric program. And then, for hematology, I wanted to be in the best training program. I heard a lot about them from my few advisers that I had. It was one of

the four places that I looked at.

**HATHAWAY:** What were some of the other places? Do you recall what some of the other good programs were?

**RUBIN:** Seattle [University of Washington]. It's called Children's Orthopedic Hospital of Seattle. Indiana University [at Bloomington], University of Minnesota, and somewhere else. I didn't want to stay in Philadelphia for that because I wasn't really that happy with the people that were in the oncology section. And some things were changing there.

**HATHAWAY:** What were some of the problems you had with it? Again, not to name names and to say, "That person I didn't like." Were these personal problems? Or were they problems about how they were going about treatment?

**RUBIN:** No, no. I didn't like their personalities. They really didn't pay a lot of attention to me. They didn't seem like a very welcoming group to me at the time. The people that I did know that were sort of my friends were the people that were in training there. They didn't seem very happy with the way things were going for them. It was a great place for the patients, but it didn't seem like a good place to train in oncology. It didn't seem like the faculty there were really very together at that moment in time.

**HATHAWAY:** You mean "together" in being good trainers, as opposed to-- I mean, as you said, perhaps the patients, the children who were there, were getting very good care. I take it Children's Hospital was one of the-- You know, you said you looked at kind of the four best, or you looked at four places that were really top of the line. But Philly would have been another place as well.

**RUBIN:** Yeah. I didn't interview there. I didn't ask for an interview, or didn't apply.

**HATHAWAY:** Right. And what about here [University of Chicago]? Somebody like Janet [D.] Rowley wasn't here at that time.

**RUBIN:** I'd never heard of this place. I had no clue. I didn't even know what the University of Chicago was. If you live in the East, you don't know the University of Chicago. If you live anywhere else, the University of Chicago is famous. It's incredible. It's one of the top schools. It's a top school, but I'd never heard of it. I had no clue about the University of Chicago. I don't know how that escaped me.

**HATHAWAY:** Well, maybe instead of saying “back East,” maybe if you said, as we used to say, “Ivy League,” then maybe you haven’t heard of the University of Chicago. For those of us out of the Ivy, there’s some awareness, maybe more in philosophy and economics and that sort of thing. Well, I don’t know anything about good medical schools versus bad and that sort of thing.

**RUBIN:** Well, I applied to a few places, and I just liked the people in Minnesota. They were just great. On the day that I interviewed, they were really excited about what they were doing and they were excited about me and they were excited about the opportunities there for taking care of patients and for research. They also had one of the best bone marrow-- Bone marrow transplant was becoming very, very important. It is very, very important now in taking care of oncology patients. They definitely did have the best children’s bone marrow transplant program in the country. I guess that was probably one of the critical things--that I would have the opportunity to train with those people.

**HATHAWAY:** And did this pan out? I mean, one of the things that you did when you went there was to learn these techniques, I guess?

**RUBIN:** Yeah.

**HATHAWAY:** What exactly were some of your duties or responsibilities? And what were some of your activities in this fellowship? Were you now kind of--? You know, it’s just the one thing for three years, and you finally-- after what, a half a century--can now settle down and do one thing, as opposed to constantly moving through and learning this and applying that.

**RUBIN:** Well, there was clinical and research training that was part of the fellowship. Both were required. You start out doing clinical for the first year, and then in the second year you start getting into some kind of research projects, as well as do some clinical. And then, in the last year, you pretty much concentrate on your research.

So I went through the clinical training, and I got interested in cytogenetics during that time. Because chromosome abnormalities and cancer were becoming the really, really big area. The ability to study those chromosome abnormalities with molecular biology technique was at its heyday. There was a woman there who happened to be a pediatric oncologist, as well as a cytogeneticist, whose name was Diane [C.] Arthur. Plus I had a background with genetics, because I had this little experience with Dr. Lubin when I was an undergraduate and I worked with Dr. Mellman when I was doing these cell culture techniques. He was a geneticist. So I had this sort of background with it. For some reason it was appealing for me to go to her lab and to

learn how to analyze chromosomes and to do some projects related to leukemia. So that's what I did. I ended up doing three or four projects while I was there and writing papers. I thought it was real interesting. But at the end of the three years I knew I really couldn't be an independent researcher. I just didn't have enough training in the lab.

**HATHAWAY:** What do you mean by "independent"? You mean being able to set up your own lab and really be a research M.D., as opposed to somebody who is seeing patients and doing clinical work?

**RUBIN:** Yeah. I knew I couldn't do that so--

**HATHAWAY:** Could you have if you had concentrated more on the research side? Although, given the step-by-step process of getting an M.D., I'm-- You know, without going into it-- I guess it's an M.D./Ph.D. program that one would need to go into or something at an earlier stage of the game. In other words, how is somebody like Janet Rowley or Diane Arthur--?

**RUBIN:** They just trained themselves. They didn't take any Ph.D. program. They're particularly brilliant people, which is one way of doing it.

**HATHAWAY:** Is to be particularly brilliant? It certainly seems to be one way. I don't know that I'd discount your talents as--

**RUBIN:** But at the end of the three years I didn't think that I could get grants, so I had a choice: either take a clinical job or do some more research training. I was getting pretty interested in the research. It was really growing on me. I really thought it was neat. There were a lot of things I wanted to do. I thought I'd at least try it for a while longer and see how it would go. So I decided, "Well, let's pick the best place that I can think of"--and that was to come here, to Janet Rowley's program-- and spend two years there and really solidify my ability to do the chromosome analysis and to learn some molecular biology techniques. To see what I could do, see what I could find out.

**HATHAWAY:** I guess I'd like to treat the three years at Minnesota and the two years here as a fellow kind of together as a unit. Perhaps that's not the best thing, but I think perhaps some of the research work you did at Minnesota was continued here or at least there was an extension of it. You said you had kind of worked on four projects at Minnesota. I don't know if we can cover them all in the same sort of detail. You did give me one article from that time to read that's more of one of these kind of retrospective-analysis studies. And then, also, I think it's the beginning of when you're a first author on a paper about some chromosome studies. You said

four projects. Maybe that's the place to start. How would you divide them up or say what the four projects were that you were working on at Minnesota?

**RUBIN:** Well, they sort of handed me one project, which really became a long-term interest in some ways. Before I had even gone there, they had decided to do some chromosome studies of children who had survived their leukemia and were several years down the line and were off their chemotherapy to see if they could make some kind of assessment of how much chromosome damage they had as a result of their therapy. Because the big concern as these kids started being cured of cancer was, "Well, what have we done to them that's now going to affect them later in life? Are they going to all get cancer again from the chemotherapy that we gave them? Are they going to all be retarded? Are they going to all be short? Are they all going to never develop any sexual characteristics? Are they all going to be psychologically damaged?" You know, all the latent, long-term effects. It was becoming important to know about those. And people in Minnesota had an interest in that. So one of the little things they did was they did some chromosome studies on the blood of these survivors. They found a fair number of chromosome rearrangements and abnormalities, but the significance of them wasn't known. But at least they just knew that they had some sustained chromosome damage.

**HATHAWAY:** And that, in some cases, right, in a few of the patients they were able to-- They had looked at blood samples or had been able to suggest that those abnormalities were definitely the result of chemo- or maybe even radiotherapy, but not existent at the first diagnosis, or the primary diagnoses, I guess, is the more correct way of putting it.

**RUBIN:** Yeah. They only studied ten patients. It was one of the few studies that was like that. I came in several years later, and I went and gathered up the same ten patients and begged them for blood samples so that we could look again at the same patients to see, "Have all these things just gone away or have they gotten worse? Are there more of these abnormalities?" It turned out that it was about the same. It wasn't really very much. But again, it was interesting just because there really wasn't any longitudinal study of these patients before. It got me interested, to a certain extent, in patients that went on to develop, actually, second malignancies. That was the big concern.

**HATHAWAY:** I guess my understanding of the situation is that certainly because of work that had been done on radiation and trying to understand x-ray effects before, during, and after the development of nuclear weapons--and of course you said, in medicine and x rays, from way before--that the medical community was already pretty aware of the potential harm, especially when used over the long term. As a matter of fact, it's the harm, in studying the harm, that I think led to notions that we can cure or we can retard the development of cancer with this treatment. As a layperson, I read these articles. As you said, people in Minnesota have become extremely concerned with the long-term effects of this kind of chemo- and radiotherapy. The long-term effects seem to be that, sure enough, down the road, in enough cases-- Of course it's

not 100 percent. I think I recall somewhere in one particular study of children, later on, it's 28 or 30 percent coming up with a secondary neoplasm. That seems rather high. And the treatment this way-- And again, I wonder about the balance between the treatment of the primary diagnoses and what the doctors and medical people expected to be got out of the treatment that, sure enough, down the line is going to lead to something, again, maybe fatal.

**RUBIN:** Well, it wasn't known. It wasn't known how high it was going to be. It's not 20 to 30 percent in any study. In kids it's probably 2 percent, 3 percent, which isn't too bad. But still people are really concerned about it. And as people are living longer, we're learning more about it. Right now there is a big concern about it. Plus, in Minnesota, with the bone marrow transplant, we were giving patients total-body radiation. Their whole body was irradiated in preparation for the bone marrow transplant. That added to the whole concern. So that was sort of the second study they did. We did skin biopsies on patients who received total-body irradiation. We showed that the amount of chromosome damage in their skin was phenomenal. It was unbelievable. The patients were fine, at least at the moment, but it gave us a great concern for what might happen later.

[END OF TAPE 2, SIDE 2]

[END OF INTERVIEW]

**INTERVIEWEE:** Charles M. Rubin

**INTERVIEWER:** Neil D. Hathaway

**LOCATION:** University of Chicago Medical Center  
Chicago, Illinois

**DATE:** 9 November 1992

**HATHAWAY:** This is our third and I suppose--because I'm leaving in a matter of hours--our last session as well. I kind of left a lot of loose ends from our last taping session on Saturday. I suppose a way to try to repair some of that or to bring it together is to start with a more general theme that you were discussing, and that was the work that was being done by people, not probably just at University of Minnesota but elsewhere as well, which was concerned with the effects of treatment and the chances and prognosis for secondary malignancies because of chemotherapy and radiotherapy. I guess the one thing that was always of the largest or of the most concern were alkylating agents, part of the chemotherapy. So perhaps a more general kind of almost history or overview would help me ask more intelligent and particular questions but also give you a chance perhaps to talk about your view of this kind of work and your involvement in it.

**RUBIN:** Right. Well, it's kind of an important area. It still is a very important area. One reason is because patients are living longer with cancer, and so it's more of a concern about how we treat these patients. Whereas before we just wanted to do what we could with them, now we want to make sure that, if they are cured, they have a long, healthy life afterwards. So it's been important. It's been a big concern for everybody from that point of view. And also it may be an interesting thing to study because usually when patients come in with cancer they haven't been followed medically before that point in time, and so you don't really know what happened to them. You don't know what they were exposed to. You don't know why they got cancer in the first place. Whereas these patients had already been treated for one malignancy. They were usually under regular medical care and surveillance, and you had an idea of what might be causing the cancer. So it gave a model for the causation of cancer to study in human beings, rather than animals or in test tubes or whatever else. It was a human model of carcinogenesis that was right before your eyes. By studying that, it might give us some understanding of how cancer comes about. Those were the two reasons why a lot of people were really interested in this, even though it could be considered to be a relatively rare occurrence.

**HATHAWAY:** Now, we had also discussed some statistics [about the recurrence of retinoblastoma and acute leukemia in children], and I cannot substantiate mine. I did, I thought, a thorough-enough job looking for it that I'm just wrong, and we'll take it at that and my apologies. I was still curious about the notion of treating people with agents that are known to

be carcinogenic themselves or perhaps to have some sort of carcinogenic effect on people. As you said, as far as you know, especially with children, 2 percent is a good rough estimate for people who will have some long-term effect from the initial treatments for primary-cancer diagnosis. I take it there was always the knowledge that something like this could be a result and that the payoff for those chances was still pretty clearly set in the other 98 percent that would probably receive some benefit from that treatment, which is either a longer life, even if it prolonged but did not put them in total remission, so that they would end up, you know, dying of some other cause. And I was wondering, had it been, in a sense, until let's say the seventies, perhaps late sixties, something that was watched and kind of followed through? Or was this really just something that people finally realized that the success rates they were having with remission, they needed to just start following this through?

**RUBIN:** Yeah. The concern was probably always there, but it only was recognized when people started living. So, yeah, somewhere around the sixties, seventies people started developing a real awareness of it happening.

**HATHAWAY:** So there was a period of time where chemo- and radiotherapy were being used and the results were rather iffy. Remission wasn't occurring, and there was just maybe a prolongation of life for a year or two or something like that?

**RUBIN:** Or a month or two, or a week or two, or whatever, yes.

**HATHAWAY:** And it was seen as really the only-- That the treatment was still worth doing because it might lead to something else. In other words, you were learning, in a sense, by treating people, what the treatment was doing over time.

**RUBIN:** Right.

**HATHAWAY:** I know this is kind of before you were practicing medicine. I'm just trying to get a sense of how the medical community would weigh such issues as these and come up with a plan of action. There seems to have been pretty consistent use of these kinds of therapies over time in different places. As a matter of fact, a frequent thing that one notices in the notes to these articles is the different kinds of protocols that are used. They seem to be pretty much the same or within certain bounds. Is that good--?

**RUBIN:** I don't know what you mean by the protocols being the same.

**HATHAWAY:** You know, the kinds of treatments that were being done. I think they have titles to them. The NIH [National Institutes of Health] issues guidelines--I guess that's what I mean; "protocol" is not the right word--and most people follow them. Or, for instance, I think the University of Chicago has been cited somewhere as having set up guidelines and limits, if you will, for treatment of such cases. Those are important points to discuss in a more general discussion of long-term effects of such treatment--knowing exactly what kind of guidelines were used and how that person was treated and how soon after diagnosis and things like this.

**RUBIN:** Actually, the NIH doesn't really issue guidelines like that. The way therapy evolves is just basically in the literature, a series of studies that go on in the literature. Every time a new study comes out it's compared with whatever else has been available before that. It's a changing thing. Different therapies become accepted as the standard of care. The NIH hardly ever issues specific guidelines.

**HATHAWAY:** I can perhaps turn off the tape recorder and try to go through this and find an example.

**RUBIN:** Now, sometimes the [United States] Food and Drug Administration will issue a warning if they learn about some danger of a particular drug. They may issue some kind of warning that goes out to all physicians. But various therapies become the standard of care based on the literature and based on existing practices. It's much less formal than you would think.

**HATHAWAY:** Maybe a good way, then, again, to pursue this is to get a sense of how you make judgments about these sorts of treatments and how, for instance, this research that you've now pursued for about ten or eleven years has affected the way that you diagnose and treat children with cancer. Again, what I'm trying to get at--and I'm not sure that I am—is to just try to find a way for you to respond to just the whole general area of how the research affects what you're doing and the practice of medicine and how it affects the quality of your patients' lives and how you do that. I'm not sure I know of a good way to get that kind of a response. Should we talk about one particular patient? Should we talk about some of these studies you've done and perhaps how they've altered your modus operandi? I guess that's what I would try to say is what I'm getting at. And again, I don't know that I have enough of a background to pull the particulars out. I kind of need your help on that.

**RUBIN:** Well, one thing is I'm not really sure whether it has really changed things that much. It's maybe raised a level of concern. But I'm not sure whether it's progressed far along enough to make a definite, clear-cut change in the way it's practiced. Certainly not in my own work alone, but if you take all the work together that's been done on this, people now avoid the agents where it's pretty clear that they're associated with a secondary cancer. Like the set of drugs called alkylating agents. They're still used a lot, but—

**HATHAWAY:** What would be the justification for that? Again, I'm convinced if I heard of a doctor treating me or someone that I knew with that kind of treatment, I might at least sit down with them and have a talk with them about it or try to find out more about it or that sort of thing. Is it a matter of kind of a last resort? Well, this should offer some sort of prolongation of life and an improvement in the quality of life for a patient. Even should this patient actually go into remission to such an extent that this person's life is going to be extended much farther than either the doctor or the patient thought, there may be some trouble down the road.

**RUBIN:** Well, the drugs have been studied a lot in terms of their effect on the tumor cure rate. If there's not any known alternative, you can't just say, "Well, this drug's no good. Let's take another one and use it." Then you'd be taking a drug that hasn't been studied at all and you'd be telling a patient, "Well, we're just going to give you a drug. We have no idea whether it's going to cure your cancer or not." You can't do that. You have to take the drug that you know is going to give the patient a 50 percent cure rate and tell the patient that there's a 2 percent chance that if you live that you might get a second cancer and that might kill you. But the benefits almost always clearly outweigh the risks, and we're used to taking risks.

We tell the patients all the risks. The patients undergo a tremendous amount of risk. The second cancer is only one of them. It's the most serious one, but they go through tremendous numbers of risks to their health, including brain development if it's a child, growth, effects on any organ that could be serious, could be life-threatening, could affect their future life. I think the patients always know that. When they're getting the drugs, it's scary for them. There is a tremendous amount of risk associated with it. But the benefits outweigh the risks by a fairly large margin. It's only when it gets to be a situation where there isn't a very large margin between the risk and the benefit that it's really maybe not a good practice. But in the meantime it's important to continually study and try and reduce the risks as much as possible, find new drugs that don't have those risks or find new ways to protect the patients against the risks. But when you're faced with a life-threatening cancer, then the patients have to accept the risks.

**HATHAWAY:** Maybe one way of looking at how the medical community kind of evaluates these things and then makes recommendations-- Again, you say there's nothing necessarily formal about this. A doctor doesn't sign up for something and say, "We will never do this this way again. We will do it this way because either a governmental agency or some part of the AMA [American Medical Association] makes you do that" or anything like that. It's really probably done, my guess is, almost on a hospital-by-hospital or a study-by-study basis. The people you work with are all familiar with the literature. You all have a learned opinion to offer, and perhaps decisions are made at that level as well as to how people will be treated. Perhaps one of the earlier studies you did, this one on retinoblastoma [C.M. Rubin et al., 1985. Intraocular retinoblastoma group V: An analysis of prognostic factors. *Journal of Clinical Oncology*, 3:680-85], this retrospective analysis is a particularly good way to look at how things are done. Actually, as I said off tape, I don't necessarily want to go through the paper page by

page, but if you could explain for me what you saw as the intent and the purpose of doing the work and then its result.

**RUBIN:** Well, when I was at the University of Minnesota we saw quite a few patients with retinoblastoma. Most people believe the patients with retinoblastoma do very well. The cure rate is 90 percent if you remove the affected eye. Just during the three-year period that I was at Minnesota, we saw quite a few patients that didn't do well. Even though their eye was removed, the tumor came back.

**HATHAWAY:** In the same basic area. In other words, it affected the same area of the eye? I mean, the eye has been removed, I realize. But that same area of the head, right? Or the other eye? Or something like that or--

**RUBIN:** No. It either regrew in the orbit where the eye was taken out or it was metastatic to the bone or the bone marrow or some distant site or to the brain. I mean, it wasn't necessarily in the same area, but the tumor came back in some way that was pretty much incurable. We were really disturbed by that. It didn't fit with what most people said about retinoblastoma.

So we decided to look back at our own experience with retinoblastoma and try and analyze the different factors that might be associated with relapse. What we did was we pulled out the old charts of seventy-five patients that we had seen in the previous twenty-five years and studied the charts in detail to see what kind of characteristics the patients had at diagnosis and what kind of treatment they received and what happened to them. By studying it carefully like that, we found that the relapse rate was fairly high. It was about, I think, 36 percent or something. That was fairly high. For us that meant, at least in Minnesota, that we needed to treat the patients more aggressively. So that for patients that had risk factors that we identified for relapse, we would take those patients and do more than just to remove their eye. Maybe give them some chemotherapy in addition to that. Or monitor them very, very carefully at least.

So it did change our practices quite a bit in Minnesota, and we published a paper that described our experience with it. But whether other people took any information out of that or whether they said, "Well, this is a fluke. People from Minnesota have a different experience than we do. We're not going to change anything that we're doing"-- I'm sure there were some hospitals that did that. There might have been other hospitals that said, "Gee, we've seen a lot of relapses as well. Maybe we ought to look at our own patients or maybe we should adhere to this more aggressive policy of treatment as well."

**HATHAWAY:** Maybe a way to kind of get an idea of how those things are done-- Have you been in a situation where in going through the literature you're presented with something that's different? I mean, you're still familiar with what is going on with this child and you go back to the literature because you need to find out more about something, and you find something that's

very current that says, you know, “We did this study. We looked at this, and really the kind of status quo treatment is not very good.” Or “We think you need to do this instead, and here are the reasons.” Even if, let’s say, their statistics or their findings are based on a small sampling, as you seem to feel that yours was in this retinoblastoma study-- There wasn’t a large enough group to make the results you’re finding really stable in the statistical sense. Would you, I mean, would you then--? Can you think of an instance, perhaps, when you had changed your practice quite quickly and quite finally because of something you’ve read in the literature? Or it doesn’t have to be reading. Come across in a meeting or something like that? In other words, how do you perceive what you’re doing here, let’s just say, at University of Chicago, you and the other people in [the Department of] Hematology/ Oncology with these kinds of-- As you say, it’s not formal, it’s a rather informal way in which these decisions are made. Is it a matter of just keeping up with the literature and constantly changing and tinkering with things? Or does that happen kind of in fits and starts?

**RUBIN:** Well, there’s a lot of tinkering, but the fact is that most patients, most children with cancer, are treated on national protocols. A whole bunch of hospitals get together across the country and form a cooperative group. They have meetings. Then they get together and they write protocols that everyone’s approved of and participated in. So that happens, but it happens on a much larger scale with a whole lot of patients, so that we learn things very quickly rather than just tinkering around in individual hospitals.

**HATHAWAY:** I guess that seems to me a rather formal process, whether it’s that the government is forcing you to do that or the AMA requiring you to do that or it’s voluntary. Perhaps it’s better with pediatric cancer than it is with other aspects of medicine, but that seems to me quite a rather formal, if voluntary, procedure.

**RUBIN:** Well, it’s completely done in the context of research. No one’s telling anyone how to treat patients or giving them a standard of care. What’s being done is the best people get together and design the best possible treatment protocol that they can think of, and then they test it. And that’s the end of it. Then a paper is written. After that people either do it--they accept that as the standard of care--or they don’t do it. They’re not telling anybody to do anything in particular. They’re doing a study for the purpose of finding better treatments.

**HATHAWAY:** Do you usually follow, especially when pretty radical or pretty clear recommendations are made for changing a way something is done? Do you usually adopt that? Is it a matter of wait and see? Do you wait for other hospitals to do that? Do you start immediately doing those kinds of changes, monitoring what the changes accomplish or don’t accomplish and reporting back? Or is this just always constantly a thing in flux?

**RUBIN:** It really changes. There’s always a new question. Once one question is answered, then

we go on to the next question. But most people, I would say, probably adhere to these cooperative groups, because the cooperative groups are studying huge numbers of patients from a lot of hospitals. So it's not like one little local hospital, like Minnesota, coming up with their own experience. But it's across the country, so most people do adhere to it. But sometimes people don't believe in the results. They think the results are wrong. Or they think that it's something that would be unacceptable to the patient or whatever. And they may not adhere to it. They might stick with their own version of it.

**HATHAWAY:** Do you find that happens a lot? Especially, again, in academic medicine, in an atmosphere as you find it here at University of Chicago, are people always open to those kinds of things? Or do you find that a lot of that stuff just doesn't get looked at or doesn't get the proper consideration it should? I don't mean you or your colleagues in your department but just-

**RUBIN:** No. I think it gets looked at. Just some questions aren't really clearly answered because they're clinical studies and there's a lot of interpretation involved.

**HATHAWAY:** I know there's no-- You know, there'd be a cure for cancer--period--if it was that nice and open and closed and you didn't have any ifs, ands, and buts. I realize that. But one thing that you said did strike me. It was something you said about being attracted to academic medicine--versus going into private practice when you finished medical school and residency and your training and that sort of thing--because in an academic situation you would be sitting in a class where you'd see that there was a talk on strep throat and you'd learn that the latest thing-- And again, we weren't putting this so much in a-- You don't necessarily need to treat strep throat right away. You can do this. The person's got it already. They're going to be sick and-- Whereas you felt that the average GP [general practitioner] or somebody in family practice, not attached to an academic or a teaching hospital, is going to be treating strep throat the way they've been treating strep throat for twenty years or so. I think that was what you were implying at least, if not coming right out and saying. So I was curious about the way that research kind of has an impact on practice, and your practice, as well as, I guess, a more general--

I'd like to get back to the retinoblastoma study, just to use it as kind of an example with one thing. I also want to say I think that's where I'm confusing my high percentages versus your lows. We're talking about a situation here of relapse, not of relapse because of prior treatment.

**RUBIN:** Yeah. A relapse is a recurrence of the original disease. A second cancer is a completely new independent cancer that has nothing to do with the first cancer.

**HATHAWAY:** Right. That's where my confusion-- This is also, though-- A concern of the

study was looking at whether this occurrence or relapse was due to prior treatment. The conclusion at this point was that we couldn't tell. It was difficult to say whether the recurrences had to do with prior treatment or it's just an insidious kind of cancer and that kind of a situation.

**RUBIN:** Well, there we'd be talking about whether the recurrence has occurred because of a lack of prior treatment. Taking out the eyes wasn't enough. Should we have given them chemotherapy and radiation therapy, as well, to prevent the disease from coming back? But there is another issue in the paper. Some of the patients did get second cancers.

**HATHAWAY:** And that's a much smaller-- As you said, it's really much lower. I'm conflating two issues into one. Again, I think we maybe cleared that up, so that we both know what we're talking about. I hope somebody who's reading this down the road knows mainly what you were talking about, not so much what I'm talking about.

I got the sense from reading that paper especially, but other ones as well that you are first author on, that it's all very frustrating. You know, you get to the recommendations-conclusions part and it's all very "Well, we really can't say one way or the other." I want to get a little bit more into this as it relates directly to your research. But I wanted to just preface it with this kind of-- I find that kind of across the board. I think we've discussed a little bit off tape your kind of leaving a lot of the research behind and getting back into the practice of medicine.

Instead of picking a particular bit of research for you to have to answer questions about, I guess I'd like to ask you, can you explain or give us an idea how some of your research has affected your clinical practice? With these rather disappointing results you get from doing-- One that comes to mind right away is the real intensive study you did on the chromosome translocations. And finally being able to say, "Well, yes, so many of our patients have these chromosome abnormalities. They've translocated. Basically the same spot. It's a high percentage." I think in one case with adults it's-- again, I hate to guess percentages now without rifling through my papers--but a quarter and above. And yet you said this doesn't really help us with prognosis and we can't make recommendations about treatment. It's great that we've got this molecular biological technology. It may be a good way to finally identify specifically certain aspects of chromosome-abnormality-related cancers like leukemia. But it doesn't help you much it seems. I would ask you, how has this research--even if it's to say it doesn't--how has it affected your practice as a doctor, as a person who cares for people, who treats them?

**RUBIN:** What I've done probably hasn't really affected it very much at all. I mean, it's probably just a question of how patient I can be. It's really important to do the molecular studies and try and understand how cancer works and what cancer is. Because normally what we do is we throw radiation therapy and we throw chemotherapy at patients and push them to the point where they just barely can make it through, because we want to give them as intensive therapy as possible. It destroys cancer cells, but it also destroys normal cells at the same time. So the patients get severe, serious side effects. But we just throw it at them. It's very nonspecific. It's

like shooting a shotgun as opposed to taking a bullet and shooting directly at the cancer. It's a shotgun approach. I think if we understand what cancer is by doing all this molecular biological research and really getting to the point where we really understand it, then people are going to think of completely, totally new ways to treat the cancers. Actually, in the time period that I've been in the field, there's been an incredible amount of molecular biology discovered. Maybe I contributed some to it, but a lot of people have.

**HATHAWAY:** And would you describe maybe just what you were doing, kind of trying to explain how that fits into treating people?

**RUBIN:** I think the impact, so far, in my mind, from this type of work that I do, hasn't affected treatment basically at all. In really minor examples of ways it has, and from that point of view it's really delayed. [tape recorder off] The impact is low. It takes a long time. It's going to take a long time because the human genome is so complicated and it turns out cancer is so incredibly complicated. It isn't just one mutation or one gene being affected. There's probably multiple genes. It's very complicated. We don't really understand it yet. We don't even really know whether the human brain is going to be able to understand it. It may be that complicated. I think it's going to be more like a decade from now when these things are going to make an impact on therapy, where we're not using this shotgun chemotherapy, radiation-therapy idea. There have been a few examples where things have been more specific in terms of their treatment, but for the most part--

**HATHAWAY:** For example?

**RUBIN:** Well, like some patients have been treated with antibodies that are directed at the cancer cells. These things haven't been curative, but it's an early step at attempting to direct your therapy at cancer rather than to just throw it at the patient. So I think it's still going to be another decade before we see major changes in the way therapy is given. From that point of view, the lag time between what I do now and changing therapy is a fairly large one. In addition to that, it's going to take some real, real genius to bring what's happening in the lab to the patient. I'm not sure whether I feel that I have the vision for that happening. There may be other people that do. I do feel like I've contributed some to the whole process, but I don't feel like I can contribute a lot more right now. In addition to the fact that because my main training is in clinical work, my main satisfaction comes out of clinical work. It's got to the point where without constant gratification in the research, where things that I've done in the lab have come to fruition, it's hard for me to maintain a high enough level of satisfaction to be doing basic laboratory work without the clinical reward. So I think other people are going to have to do that. I'm sure they will and they are. Whereas I myself, just for my own personal satisfaction, I'm going to have to get my rewards in the clinical area.

**HATHAWAY:** You say it's going to take a genius to be able to maybe cross this bridge and to have the kind of "vision"--the word you used--to see what role what you called in a note you wrote to me "esoteric research" is going to play and how you're going to do that research to make it pay off in the way that we take care of people's health and the way that we help them when they're sick. I guess I would almost want to play devil's advocate with you and say, "Actually, isn't it somebody probably that doesn't need to be a genius so much as somebody who has a very good idea about what treatment is about and what it's supposed to do? But also somebody who has just a very good knowledge and understanding of, let's say, something like the genetic processes that are actually involved in cancers, in our specific example here?"

In other words, isn't it someone like you, or perhaps the cytogenetics group that you're working with here? Aren't these the people who are going to be the ones who build that bridge across? Even if you're frustrated by the fact that-- When you do clinical stuff somebody smiles, a child smiles at you and appreciates the work you're doing and is better for six months even or six years, if that's the payoff. It's probably very nice. It's not even just, "Look at this beautiful thing I just genetically engineered in the lab." I mean, it has a lot more to do with a lot of things we've talked about on previous tapes, about your interest in children and what you want to do and how you've really had that vision of doing it since you were eighteen or nineteen years old, certainly, maybe earlier. But what about the combination of the two, the rather frustrating part of working in the lab and the rewarding part?

**RUBIN:** Well, I think there's a lot of people that get satisfaction out of doing it that way. They're people that are very capable. They're able to keep up their clinical skills, keep up with the clinical literature, keep up in the lab, spend a lot of hours at it. I don't have that. You know, I have to take care of my family. And I only have so many hours. So I don't really want to split my time between two completely major things, two things that require two what I would consider to be gigantic efforts. You know, one, to know how to take care of patients and keep up with that field, and the other, to do very highly competitive molecular biology research, competing for grants to do that work and keeping up with that literature. Those are two gigantic efforts. There's a whole lot of people, you know, very, very remarkable people, who are doing that.

**HATHAWAY:** Who is? Can you name some within your own personal experience who really are as good a clinician as you are? I think we'll get a little bit into it.

One of the things in your Pew [Scholars Program in the Biomedical Sciences] application that people are very impressed by is your ability to have picked up with very little background some molecular biology techniques and apply them elsewhere. That's pretty creative, "brilliant" even, I guess, is a word that somebody used, without calling you a genius or stroking your ego too much. Quite a few people thought you certainly were one of those people. We can get into the issues of time and family, I think, also, but--

**RUBIN:** Well, it's been satisfying up till now. It's been a lot of fun to be able to do both. But there are some people that are really impressive to me.

**HATHAWAY:** Who? Again, if we could maybe-- They won't be reading this, I suppose.

**RUBIN:** Well, different people. There's a guy named Gary [M.] Brodeur who is at Washington University, Saint Louis, who is a pediatric oncologist. He does research on a pediatric tumor called neuroblastoma. He does both really well. He's really respected as a clinician. The work that he does in the lab has come to clinical applicability. I mean, it does actually have a major impact on what happens in the clinics. So he got that satisfaction.

**HATHAWAY:** How long would you say that he had to work on that stuff in the lab to have it come out? Or is it just it was two years? He was really lucky?

**RUBIN:** I'd say he was pretty lucky. Probably only a matter of years, you know, where it obviously had a clinical impact.

**HATHAWAY:** And he had a vision. I mean, he made this happen in two years. We say "luck" but-- Or do you think there was more work done on, let's say, nerve cells, as opposed to the kinds of tissues or blood cells that you were looking at and things like that?

**RUBIN:** Well, he was lucky that he was working on the right gene that turned out to be an important one, but he was also smart enough to pick up on early clues that this was the right thing to be working on. He's been able to successfully do what I would call two jobs, as well as being a fantastically interesting person that has a fantastic family life, as well, in Saint Louis. So there are people that can do it, quite a few people that can do it. We're lucky to have them around. And there will be more.

**HATHAWAY:** I guess I get a sense that maybe with getting the Pew [fellowship] and being selected for it and going through doing it and then a lot of the research, that you indeed feel that you've tried to do this and it's not something you can do? Or is it something you don't feel you want to do?

**RUBIN:** Well, the immediate satisfaction isn't there. That's one reason why I'd like to shift to one area which I know is very satisfying to me, which is clinical. The things that I've been working on didn't give a clinical satisfaction within two to five years like maybe Gary Brodeur's work did.

**HATHAWAY:** As you just said, you see another decade or so's worth of work before there might be some sort of direct applicability between that kind of basic research and clinical practice.

**RUBIN:** Right. It's just the nature of the work that I'm doing compared to some other people. The fact is that it's not just what I've done in my lab. It's other labs that are working on chromosome abnormalities in leukemia as well. I don't see there, either, the direct effect on practice yet.

**HATHAWAY:** In reading the literature that you gave me, neither do I. It does seem to be still quite a ways away. Indeed, at best you've got markers now for understanding-- You know, the past two decades of work into oncogenes and into the relation between viral genes and other eucaryotic genes in cancer has been pretty much worked out in a basic research way. But that's what you've got now. It's almost as if you've done what Linnaeus would say you're supposed to do in biology, which is categorize and define. Now the next step, which does seem to be a very long stairway, has yet to come. I also found it, of course, fascinating. I don't mean just in some sort of like intellectual way of "Oh, we get to read this." But just the depth of understanding about what's going on on a cellular and on a genetic level with the development of something like cancer cells in a system and things like that. Would you say that that kind of knowledge helps you in a clinical setting?

**RUBIN:** I'd hate to say no. I think so. It keeps you wondering what's going on in the individual patient. Now, whether that actually helps the patient, I'd say probably not. But it certainly helps you keep up your own interest in everything that's going on in the patient. Sometimes we come up with things on the ward with the patients where you see something a little strange. Maybe it fits with something going on in the lab. You want to check it out. Occasionally it becomes interesting.

**HATHAWAY:** I guess I would like to spend some time on this. I then think we'll move back to your recent, let's say post-Pew, scholarship. I assume you were married before the Pew funding ran out. We talked a little bit briefly off tape about your kind of giving up the lab in the sense of day-to-day work. You help oversee it, but there are other people doing the work. You're just offering advice and suggestions and keeping track of what's going on, because, of course, you do know a lot about it. I would like to kind of cover some of what you've done over that past five years and what kind of research you got into once you got out of the fellowship here and into the mainstream academic world, if you want.

[END OF TAPE 3, SIDE 1]

**HATHAWAY:** I guess you were a fellow here [University of Chicago] for two years before you were hired as a-- I don't really know what the proper term is. I'd sort of ask what the transition was like from [University of] Minnesota? Were you recruited here? You just knew? You had finally-- As you said, you're from the East Coast. You'd never heard of University of Chicago, but once you move out of that orbit you find out about it real quickly. How did it come about that you're here?

**RUBIN:** I was not recruited. I was in my fellowship there, and I decided that I wanted to do more research training because I felt that I wanted to do more research work, at least for a period of time, as intensively as I possibly could. I wasn't really fully trained for that at the end of the three years in Minnesota.

Janet [D.] Rowley is the head of the sort of chromosome program here. She's very famous. Everybody knows her. I knew about her. She's [written] many, many papers. And her associate, Michelle [M.] Le Beau, also, who is a young person, was rapidly becoming very, very famous in the area of chromosome abnormalities in leukemia. I was well aware of their work because they wrote many, many papers in a short period of time and were just very well known.

I heard Michelle Le Beau speak at a meeting while I was in Minnesota. I went up to her and asked her if there was any opportunity for training after I left Minnesota. She said, "Definitely. Send your CV to Dr. Rowley." I did that, and they invited me down here for an interview and I ended up taking the position.

**HATHAWAY:** That was two years more of training, working, I guess, really in the cytogenetics lab and doing research with the both of them. Actually, it seems like quite a large group of people in the lab.

**RUBIN:** Right.

**HATHAWAY:** A lot of them M.D.'s as well, including, again, Le Beau, right?

**RUBIN:** Dr. Le Beau has just a Ph.D. Dr. Rowley happens to have an M.D., and it's in the Department of Hematology. So a lot of the doctors that were in their area that we met with every day were physicians. There was a lot of clinical influence there, so we were very in touch with what was happening with the patients. We received samples of bone marrow from patients. We knew a lot about the patients, because the doctors were there to talk to us about it. That was very helpful.

**HATHAWAY:** What exactly did you start doing when you got here? Was it just, you know, in other words, part of the lab that was leading to other people's--? In other words, was something new developed because you were here and there was an extra body and what you were interested in? "Well, let's start that as well" or--?

**RUBIN:** Well, I started out just doing the basic technical work of cytogenetics, which I had already learned in Minnesota. Cancer cytogenetics is a very difficult field to learn because many of the samples we received had tremendous numbers of complicated chromosome abnormalities. It takes quite a few years to get skilled at analyzing the chromosomes. I needed more experience with that. That was certainly one of the key, major jobs that I had right away was to analyze cases, analyze real clinical cases, and get more experience doing that. But at the same time, I had extra time to develop on my own different questions that I had that I would like to try and answer. Part of it was to try and correlate the chromosome abnormalities with the clinical features of the patients and see what they meant in terms of whether they signaled anything about the disease, whether it signaled anything about what the diagnosis actually was or whether it signaled anything about how well the patient was going to do or not do. Dr. Rowley already had a lot of questions there, as well, but hadn't had time to carry them out. We talked together quite a bit about what questions we had and what was important and what we wanted to do. In doing that, we put together a few relatively small projects which involved simply comparing the cytogenetics with the features of the patients and seeing if there was anything common about them. That resulted in a variety of projects.

**HATHAWAY:** How would you--? Maybe this is getting back to something we've already discussed. Maybe we can give it some kind of concrete or particular emphasis. Is this where you were kind of finding that more work needed to be done both in basic research and the correlation between that research and patients to really have this kind of payoff in better treatment or more exact treatment? That the correlations you were trying to set up still weren't leading to anything final in that sense?

**RUBIN:** Well, the correlations were a form of retrospective study, because we would do the cytogenetic analysis. We have entered all this information into a computer, and then we could ask the computer to give us a list of all the patients that had a translocation between chromosome 3 and chromosome 21. Then it would give a printout of five patients. We'd get the charts, and we'd see, "Oh, all these patients have the same diagnosis. All these patients died within one month. Here's a correlation. This is interesting. We ought to let people know. If patients have a 3;21 translocation, you better watch out, because they're not going to do very well." You know, that kind of thing. But it was a retrospective study, and it had limited significance because of that. What would be much more significant would be to take that seed of information and then to go and do a prospective study where as patients came in you identified what the chromosome abnormality was. And then say, "Well, let's test a hypothesis. If we treat those patients more intensively--"

**HATHAWAY:** Will we prolong their lives?

**RUBIN:** “--will we do better?” Or vice versa. If there was a chromosome abnormality that was associated with a great prognosis, could we treat them less? Well, we were planting seeds for prospective studies by doing that. That’s what we were doing. One could consider that to be perfectly fine. I’d say it still was a little bit disappointing in terms of the amount of time that it takes to get to anything that really has an impact. But I think it was somewhat satisfying to plant these seeds.

**HATHAWAY:** Whether you’re in the lab yourself doing kind of hands-on work, I take it these seeds are kind of being watched and maybe a little bit of fertilizer is being put on there. They’re being tended, I take it. Even if your direct involvement may have been cut back somewhat, this is still going on. I mean, there’s still the hope and the realization that this will pay you should be doing it this way off somewhere down the line. It’s just a while to go. Have you much interest in also talking about the technical work that you did, just the technical aspects of it? Again, in your Pew application, people were quite impressed with your ability to take some techniques and develop them to find out things that you needed to find out. So you kind of worked on that.

**RUBIN:** Well, the only technique that would be unique was this pulsed field gel electrophoresis. One of the problems that came up in molecular biology was that many genes were very large. In being so large, the standard technique of DNA analysis, which was Southern blot analysis, was inadequate because you only were analyzing very small regions of DNA which were well inside a gene. If you’re only analyzing a tiny little area of it, there could be mutations or abnormalities that were outside that area that you’d be missing and couldn’t identify. So a technique was developed in yeast genetics that’s called pulsed field gel electrophoresis, where you could look at very large pieces of DNA. It’s really just a variation on Southern blot analysis. But nevertheless, you took large pieces of DNA so that these big genes were contained within those pieces and if there was any rearrangement of it you’d be able to detect it. We had chromosome abnormalities and we had probes, but the probes didn’t detect anything. We thought that it was because either the gene was far away from the probe or the probe was within a huge gene and we just couldn’t get close enough to the rearrangement. So we used pulsed field gel electrophoresis. Maybe we were one of the first groups to actually apply it to human cancer work. We were able to immediately see the rearrangements or the mutations, whereas otherwise they were basically unidentifiable. That was really exciting.

**HATHAWAY:** And this was a group kind of realization? I mean, you were reading something one day about yeast genetics and here’s this great way of getting at the larger chunks of DNA and bigger genes. You said, “Wait, this is exactly what we should be trying on our thing.” Or somebody called you up on the phone and said, “Hey, you should be doing it this way”? I guess

I'm trying to get a sense of how it was decided that—

**RUBIN:** Well, people here already recognized that it could be an important tool for this work just as I was sort of coming in here.

**HATHAWAY:** And you were the one who figured out--

**RUBIN:** I was sort of the student that said, "Well, let's work on this."

**HATHAWAY:** And you were, in a sense, kind of the leader in figuring out, "Well, yes, it needs to be done. We just need to make it work for us and maybe fiddle with the process a little bit or even a lot to get--"

**RUBIN:** That was the main thing. I fiddled with the process. I hung around. I came in at night. I came in on the weekends. I said, "This is going to work," and I got it to work. It gave immediate, obvious results.

**HATHAWAY:** It worked.

**RUBIN:** Right.

**HATHAWAY:** That certainly must have been gratifying, I guess, in the way of treating a patient who comes through some treatment well and is better and healthier and happier because of the treatment that you've given them, right? Maybe not as much as when you're helping a particular person. The results can be much more rewarding, simply because a gene probe isn't going to thank you. But I certainly would see it on the same level.

**RUBIN:** Well, we had a success. We knew what we wanted to do and we did it. Anything that you do, whether it's a project in your house, fixing up your house, or whatever it is, if you have a goal and you get to the end of it, it's satisfying.

**HATHAWAY:** But I think maybe perhaps a little more when the means and the methods are maybe a bit of a challenge but where you've conquered them or you've made them work the way you want them to is perhaps maybe even more rewarding than simply, you know, "I've got to clean up my room. Okay, I finally cleaned it up." Instead of developing this great new way to

clean up your room maybe in less time and also get it more organized or something like-- You feel more satisfied, I guess.

These first two years it sounds like you were actually what seems to be the typical lab worker's dream. You're here eighty hours a week. You come in at night. Medical students do it as well, and so you'd been doing it before. It's not that all of a sudden you were even working another twenty hours a week, as if you could. There wasn't even twenty more hours, probably, to do it. Did you finally just kind of burn out on this? Or when you finally went from the training program, the fellow program, to an actual academic position, were there just more responsibilities in another way that made this kind of concentrated effort difficult or annoying?

**RUBIN:** Not really. I wasn't annoyed by it that much. I really cut down my hours a lot when I got married.

**HATHAWAY:** And this wouldn't have been as you change over from being a fellow to an assistant professor but a year or so after perhaps?

**RUBIN:** Yeah, about that.

**HATHAWAY:** This probably-- And as we're coming to the end, we did want to, at least I assumed you-- You know, I think I talked to you-- Do you want to talk about your family? What's happening now is obviously as important, if not more important, than anything else in your life right now. You know, maybe we should talk about how you met-- I want to call her Gretchen [Gearhart Rubin] because somehow Mrs. or Ms. something does not seem quite-- Even though I haven't met her. Where did you meet her? Here at the hospital?

**RUBIN:** Yes. She was in public relations here in the hospital. It was important for her to know about new people that were coming on the staff. If there was anything interesting that they were doing that could result in some publicity for the hospital, then that was her job to make sure that that happened. Or if something was happening outside the university and newspapers or television reporters needed some expert to talk about what was happening, then she would want to know who to call and who to get that from. Also, for her, the goal was promoting the hospital and the image of the hospital. As soon as I came in, she came to talk to me and interview me and at least find out who I was, so that she would know if she needed something from me that she'd be able to do that. That's how we met. We basically just met here in the hospital in the course of normal hospital business.

**HATHAWAY:** Right. We don't need blow-by-blow, detailed description of the courtship or anything like that, but was this really the first time seriously that you considered marriage and

family? Or that's just kind of happened without much consciousness of "Oh, it's time to settle down and raise a family"?

**RUBIN:** No. I would have wanted to earlier, I'd say. This was just the first relationship that led to engagement and marriage. But I probably would have been interested in doing it earlier. I wanted to have a family for quite a while.

**HATHAWAY:** I know it's hypothetical, but that's sometimes a good way to perhaps get some insight into how people think and what's important to them. Do you think you would have been faced with the same issues, but earlier, of dividing your time properly between raising a family and a career and caring for people? We won't even put it in terms of a career and making a name for yourself, as opposed to the responsibilities that are clear. You know, it's clearly the case that you feel you have them and need to pursue them as a doctor. Do you think it would have happened earlier had you met somebody else earlier where it led to that situation? Or if you'd met Gretchen earlier? That you'd have been faced with these issues of "How am I going to spend eighty-five hours a week at work and eighty-five hours a week at home?"

**RUBIN:** Yeah. That would have been an issue for sure.

**HATHAWAY:** Has that been a difficult balancing act? I mean, is it still? Or have you come to terms with it and handled it and now it's just a matter of enforcing it and keeping it going? I can tell you why I ask. Because when I first talked to you on the phone, and I started talking about how to arrange this and my scheduling needs, the very first thing you told me was that you had to be home at eight P.M. or something--I think it was eight P.M. or six P.M., I'm not quite sure--because that's when you had dinner with your family. You put your three daughters to bed. And that it didn't really matter if I had to stay an extra week or that sort of thing. This was first and foremost. That was not going to be interfered with. I noted right away that this was something to talk about too, as well, on tape. Has it been difficult or stressful?

**RUBIN:** Maybe slightly stressful. Because sometimes I feel like I'm not doing all the things that the university might want me to be doing, especially living away from here, living in the suburbs.

**HATHAWAY:** Were you living here earlier? I mean, before the family you were living in Chicago?

**RUBIN:** Yeah. A lot of the real serious academic people live in Hyde Park, and so they socialize with each other. They see each other. They can stay here longer. It's a little easier

maybe to be part of the community. Maybe they get a lot more done that way, know a lot more people, have more collaborations and ideas that way. Whereas if you just leave, some of those things don't develop. So you could say it's a little bit stressful. It almost makes you wonder about your longevity at the institution.

**HATHAWAY:** I thought you meant your own health. You're talking about-- All right. Are you tenured? You're all at this kind of point where you're either up for it or you've just been up for it. So I usually tend to avoid the subject.

**RUBIN:** No. I'm an assistant professor. I'm on the tenure track. So at some point within five years of becoming an associate professor, I'd have to be awarded tenure.

**HATHAWAY:** Of being an associate or an assistant?

**RUBIN:** Of being an associate. I'm not even an associate yet.

**HATHAWAY:** But that's maybe a different length of time in a more traditional kind of Ph.D.-type program, like a biochemist or molecular biologist, where it seems to be a five-year-- You got your assistant level, what, four years ago, five?

**RUBIN:** Yeah, in '87. I have a total of seven years to get promoted to an associate professor, and then I have five years--

**HATHAWAY:** Okay, seven, which is more typical, I guess, of like regular university departments?

**RUBIN:** Yeah. And then after that I have five years to get tenure. So, yeah, it's a little bit stressful.

**HATHAWAY:** I take it this is still what you want--that you're not looking for just simply affiliation with a hospital. That you want to stay in academia and you want to know about the newest way to treat strep throat and not just treat strep throat the same way that you've been treating it?

**RUBIN:** Well, it's also because I'm a pediatric oncologist. You don't do pediatric oncology in

private practice. You do it in the university. That doesn't mean you have to be writing a lot of papers and doing a lot of lab work, but you have to be involved in some kind of activities related to research.

**HATHAWAY:** What about teaching? I noticed on your CV that in 1992 you were going to be teaching molecular genetics, to med students I assume.

**RUBIN:** Yeah. I give one lecture a year. The first year I did that was last year.

**HATHAWAY:** So you just teach one part of a course that's called Molecular Genetics? And each one of you on the faculty does that, teaches a specific part of it? Or is there somebody who really does teach the class?

**RUBIN:** There are two people that are in charge of it that give most of the lectures, but they asked me to give one lecture just because--

**HATHAWAY:** So your class type of teaching is very minimal as compared to for instance rounds?

**RUBIN:** Yeah. Most of the teaching that I would do is rounds.

**HATHAWAY:** As I've told you--and I have probably said too many times on tape--you're my first [M.D.]. So if you could maybe either pick out some of the areas you'd like to discuss as to what are your duties and responsibilities outside of treating patients and the research that you've done-- I'm trying to get at some sense of the whole person here and what your responsibilities are and how you manage them and that sort of thing. Is doing rounds a daily kind of thing you're involved with? I get the impression from your CV that you're in charge of the pediatric rounds.

**RUBIN:** No. I'm not in charge of pediatric rounds.

**HATHAWAY:** I'm really doing well here today.

**RUBIN:** I'm in charge of the ward just one month out of the year. Now that's changing, because I've asked for a lot more clinical time and a lot less laboratory time.

**HATHAWAY:** So you'll be doing that more, then?

**RUBIN:** Yeah. But whenever I am so-called "on service" downstairs, then we do rounds every day, twice a day, in the morning and afternoon, and talk about all the patients and in the context of that make teaching points and comment on how the residents are handling the patients and try to readjust what they're doing to what we think is right. That helps them to learn about it. We also have lectures for them which we'd be in charge of for that month. That's a lot of fun.

**HATHAWAY:** I was going to say, do you find that a particularly rewarding part of what you do? Again, teaching clinical stuff to up-and-coming doctors?

**RUBIN:** Yeah. That's a lot of fun. Well, it's one group that's together for the whole month. There's usually three residents, a fellow in training, and then myself. So we're a team. We do things together. We learn together. We take care of the patients together. It's really fun. You get to know them very well. They learn a lot. And it's challenging. It's really enjoyable. Of course they do a lot of the hands-on work with the patients, whereas we just go around and schmooze with the moms and dads and tell them everything's okay. They look up to us. The parents look up to us. But the hands-on work of drawing the blood and putting in the IVs [intravenous tubes] and scheduling tests and all that stuff is basically done by the house staff that are here, which in one way is a superluxury. We just get to come in and make nice with everybody in terms of the families and the patients and not have to be the ones to stick them with needles and so on. So in one way it is a superluxury. It's also a little bit standoffish from the patient, and that I don't like that much. I like being right in there.

**HATHAWAY:** Twice now that I've been here, you've taken the time that I use to either set up or take down my stuff to go visit a patient. Has it been the same patient?

**RUBIN:** Yeah. The two times was the same patient that's been in the hospital. One of the patients that I follow sort of as my own patient has been in the hospital.

**HATHAWAY:** That's somebody who has come in through the system somehow, either referred by his or her own pediatrician, or he or she doesn't have one, in the case of many, I'm sure, of the patients here, but somehow has gotten into the system. And you come along, and you decide, "Okay, here's a patient I'm going to be responsible for." Or does it get kicked up to you through the various levels of house staff because the patient presents a case that's particularly either difficult or particularly right up your alley?

**RUBIN:** Yeah. All the pediatric oncology patients have to be taken care of by either a fellow or a staff member that specialized in pediatric hematology. The residents don't take care of them on a long-term basis, just when they're in the hospital. When I'm on service, or if I'm on call for the weekend and if a new patient comes in, you immediately sort of bond with them. They look up to you. And either the fellow that you're working with or yourself becomes the primary responsible physician for them longitudinally till their treatment is finished, or whatever, and beyond. This was a patient that came in last time I was on service, which was in May of '92. She comes in and out of the hospital for either complications or for treatment.

**HATHAWAY:** So she hasn't been hospitalized the entire time?

**RUBIN:** No. You get very close with them. Right now I'm not on service, so they have to deal with other doctors that they may not know as well. So I just go down every day, find out what's going on, see if they have any questions. If there's something that I disagree with that the other people are doing to the patient, then I might go and talk to them and try and come to some kind of agreement about it.

**HATHAWAY:** And you saw her on Saturday. Did you come in Sunday as well?

**RUBIN:** No. I just tell them, I say--

**HATHAWAY:** Helped some little patient downstairs, right. You wouldn't normally come in on a Saturday maybe, or maybe you would and I'm just--

**RUBIN:** No. But if I'm here, I have to go down and see her.

**HATHAWAY:** Sure. No, no, no. You were here because of me, so I had something to do with that, right?

**RUBIN:** That's right. But I just tell the mom, "I'll see you Monday. My beeper's on." If she had any major problem, or if she was upset by anything at all, then she could call the operator and have me paged. You know, that kind of thing.

**HATHAWAY:** One of the other things that I noticed on your CV intrigued me. Perhaps, given the way the interview's gone, it might be a good way to go. It's a program here about-- It's not

cancer prevention, but it's risk evaluation or something like that.

**RUBIN:** Yeah. The [Joint Pediatric/Medical] Cancer Risk Clinic. That's another area where I might get a patient even if I'm not on service because I kind of specialize in patients that have a genetic susceptibility to developing cancer. One kind of patient like that is the patients with retinoblastoma. Pretty much any patient with retinoblastoma who comes in I eventually become their doctor because I'm recognized as the person that's interested in that here. There's a whole bunch of other categories of patients who either don't have cancer but have a condition that predisposes to cancer or they have cancer and it was recognized that the reason they got cancer was because they had a genetic predisposition. So we evaluate them and explain to the patient or the family about the genetics. You know, teach them about the genetics of the situation and how all this came about, as well as to tell them what the risks are--that that individual might get another cancer in the future or that a sibling or other relative might be at risk. And try and identify which people in the family are at risk and what they should do about it.

**HATHAWAY:** Now, this isn't just you. You said "we." Could you give me some idea of who is--?

**RUBIN:** Well, there's one pediatrician involved, and then there's a medical oncologist involved whose name is Dr. Funmi Olopade, and we have a genetic counselor. So the three of us are sort of the critical team. We see patients in clinic, and we do a lot of the work over the telephone for patients that don't live around here. Otherwise, if the patients are in the hospital here, or are being treated here, then we see them there.

**HATHAWAY:** Whose idea was this? Was this something that was here that you've just gotten involved in? You replaced somebody else? Is it something you said we need and started?

**RUBIN:** Yeah. It was something that I said I wanted to do.

**HATHAWAY:** So you found-- I assume it was a him.

**RUBIN:** No. It's a female. Dr. Olopade is a female. I decided I wanted to do it. I went to the higher-up people and said, "I want to start this clinic. I'm really interested in these kind of patients, and I'd like to have a place for them to go. I'd like to attract more patients like this down here." And they said, "Well, that's fine. There's somebody else that happens to be the right kind of person for this who could take care of the adults and you could take care of the kids. And we'll give some money to buy a genetic counselor. We'll see how the program goes. If it's really successful and if it brings a lot of patients down here" and so forth-- Or "If it

increases our visibility and helps a lot of the patients, we'll keep it going.”

**HATHAWAY:** How long has it been running?

**RUBIN:** Just ten months, or less.

**HATHAWAY:** Would you say it's been a success? You know, that it may be meeting your expectations?

**RUBIN:** Yeah. It's been really great.

**HATHAWAY:** Do you think it's meeting the hospital's as well? Or the higher-ups, the powers that be, so that it will be around for a while?

**RUBIN:** I think so, yeah. We get a lot of phone calls from people. There's a lot of people that are concerned about why they got cancer. Many people that think it's on a family basis. So there's a lot of people that want to talk about it. In addition to that, we've met up with some really amazing families that have a lot of cancer in their family that we've been helpful to.

**HATHAWAY:** What about the situation where there's just a general understanding--? I know, I understand, with leukemias and things like that that there really is the genetic-- And I don't mean just genetically in the question of inheritable diseases, and this being in many cases a lot of leukemias are probably related to that, as far as I know, right? Or as opposed to the genetic alterations or transformations coming about from environmental carcinogens and then coupled with perhaps inheritable genetic disorders or abnormalities. What do you think about other situations, where, as you say, some amazing families were cancerous?

**RUBIN:** Yeah. Leukemia is not a big player in this inherited type. In adults breast cancer is major. There's a major genetic component in breast cancer. Now, there's some families where there's just isolated occurrences and there's no evidence of any genetic problem. But there's some families where there's clearly a genetic pattern of transmission of susceptibility to the disease. The same thing's true for colon-- You know, there's a certain percentage of colon cancer that's hereditary. It involves huge numbers of patients, because these are diseases that are very, very common. Breast cancer and colon cancer are really the big players in adults. In kids it's much less in terms of numbers. But retinoblastoma-- About 40 percent of patients with retinoblastoma have a genetic form of the disease. They can pass it on to their offspring. Half of their offspring would be at very high risk. It's almost a certainty that they would get

retinoblastoma. And then there's quite a few other situations, but they're all very low frequency. If you add them all up together, it becomes a significant number of patients.

**HATHAWAY:** What about the role of gene therapy, especially with the inherited kind of cancers? Does this clinic work mainly as just an advice [center] and a place for people to come and talk about these issues and maybe learn more about their situation and the situation for offspring and things like that? Or is it also perhaps a way for people like you who are interested in doing further work with this to collect data, to start doing prospective analysis, as opposed to retrospective?

**RUBIN:** Yeah. It's a forum for research as well. We're setting up a computer database so that for all the families that come in the information is recorded. We're doing studies. We're involved with different studies. Some of the studies involve using drugs to prevent cancer in people that are susceptible. That's really exciting. Those are the main things, studying prevention techniques, as well as all the counseling that--

**HATHAWAY:** And you don't see this kind of work or the collection of this kind of data as helping something like, again, advances in gene therapy or things like that? Or is that not really an area that's seen as--?

**RUBIN:** Well, gene therapy doesn't really apply very well to this group of patients. They're people that have deficiencies of a gene. If you can give the gene to the right cells of the body, then you can correct it. Like, for example, if somebody has an immune defect, an immune deficiency, because they don't have a certain gene, then you take out their bone marrow. You add the gene to those cells, using viral transmission vectors. You give the bone marrow back to the patient. It grows in the body, and it gives them a healthy immune system. But for cancer susceptibility, for example for retinoblastoma, you can't replace the gene in the retinal cells unless you trans-plant the eye, and, of course, that's not possible. That's impossible, and we can't do that. You'd have to remove their eye or you'd have to somehow get the—

**HATHAWAY:** You'd have to be doing therapy on the parents' genes or something strange like that, where that gene wouldn't be passed on, which is, again, a very frightening--

**RUBIN:** The techniques aren't fully available yet, although I suppose that it could be possible if you could do it at the embryo stage.

**HATHAWAY:** Well, they're doing it in mice apparently. They're knocking out their genes. It's germ-line cells that they're messing around with certainly, or can mess around with now. Very

frightening. At the same time, who knows, maybe for someone from your perspective it also may be very exciting, although there are all sorts of ethical questions about messing around with germ-line cells in humans, and perhaps it may be as controversial now or it will become so soon as the cloning was back in the early seventies, when people would say, “Oh, my God, we’re going to have giants and people living till they’re seven hundred, things like that.”

We are kind of coming near the close of the inter- view. I guess really before we do, is there something you want to say? Do you want to say something nasty to somebody at the Pew, or say hello to your mom, or do you have something that you’d like to add? I got a sense that you were a little reluctant to do this interview or were not really gung ho. Some of your colleagues just can’t wait to talk about themselves. In this context, I think that’s a good thing. Would you say maybe the experience has changed your mind a little bit, that it’s been, who knows, some sort of a therapy? I don’t mean that you need therapy, but just going through this process has been a positive thing?

**RUBIN:** Yeah. I suppose I go through the process anyway, but it was a lot of fun to recall a lot of things from early childhood, for myself. It was fun to think about some people and some things that I hadn’t thought about in a long time.

**HATHAWAY:** Well, it’s supposed to have that effect, I think, or I hope to have that effect. This is not just something you’re doing for either some previously very kind granting agency or for me or for the history of medicine in the future. It should also have a good effect on what you do too. I mean you get something out of it as well. And you say, “It was good for me to recall those things.” I think it’s very good for other people as well that you did. It’s very interesting and I thought also very carefully thought out and yet also a fresh, spon- taneous recounting of your childhood that is very interesting. I have nothing more to add except to say thank you for your time. I do appreciate it. I know you’re very busy, and it is hard with your full-time job and a family at home to squeeze yet another seven or eight or nine hours’ worth of time in just a matter of four or five days. So I do appreciate it. You’ve been very gracious. I thank you for your time.

**RUBIN:** Thank you.

[END OF TAPE 3, SIDE 2]

[END OF INTERVIEW]

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