SCIENCE HISTORY INSTITUTE

THEO COLBORN

[Theodora Emily Decker Colborn]

Transcript of an Interview
Conducted by

Jody A. Roberts and Elizabeth A. McDonnell

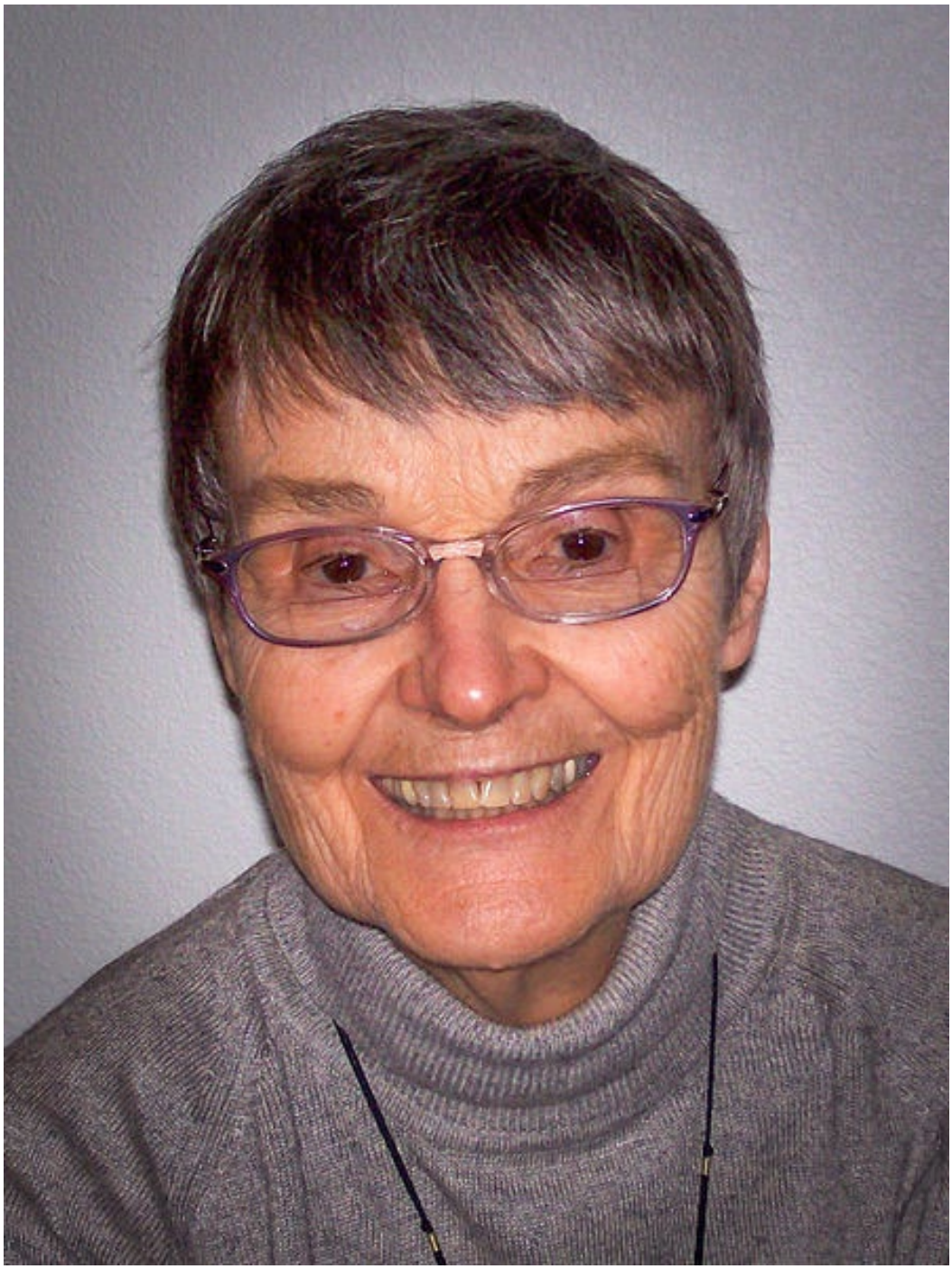
in

Paonia, Colorado

on

7 and 8 August 2009

(With Subsequent Corrections and Additions)



Theo Colborn

THE CHEMICAL HERITAGE FOUNDATION
Oral History Program
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THEO COLBORN

1927	Born in Plainfield, New Jersey on 28 March
2014	Died in Paonia, Colorado on 14 December

Education

1947	BSc, Rutgers University, College of Pharmacy
1981	MA, Western State College of Colorado, Gunnison, Science (fresh water ecology)
1985	PhD, University of Wisconsin-Madison, Zoology (distributed minors in epidemiology, toxicology, and water chemistry)

Professional Experience

Rocky Mountain Biological Laboratory

1979-1980	Summer Field Research

Office of Technology Assessment, United States Congress

1985-1986	Analyst
1986-1987	Congressional Fellow

Conservation Foundation, Washington D.C.

1987-1988	Associate

Environmental Health Analyst

1987-1990	Consultant

World Wildlife Fund

1988-1993	Senior Fellow
1993-2003	Senior Scientist and Director, Wildlife and Contaminants Program

W. Alton Jones Foundation

1990-1993	Senior Fellow

University of Florida, Gainesville, Department of Zoology

2004-2007	Professor
2008-2009	Professor Emeritus

The Endocrine Disruption Exchange (TEDX)

2003-2014	Founder/President

Honors

1985	United States Congressional Fellowship, Office of Technology Assessment
1991	The National Water Alliance Award for Excellence in Protecting the Nation's Aquatic Resources
1993-1996	Pew Scholars Award in Environment and Conservation
1994	National Conservation Achievement Award in Science, National Wildlife Federation
1997	Women Leadership in the Environment Award, United Nations Environment Programme (UNEP)
1997	Rachel Carson Leadership Award, Chatham College
1997	"Change Makers Award," State of the World Forum, Mikhail Gorbachev
1998	A Century of Conservation, 100 Champions of Conservation, Audubon Magazine
1999	Norwegian International Rachel Carson Prize
2000	International Blue Planet Prize, Asahi Glass Foundation, Japan
2003	Rachel Carson Award, Society of Toxicology and Environmental Chemistry
2004	Rachel Carson Award, The Center for Science in the Public Interest
2006	Dragonfly Award, Beyond Pesticides
2007	A Woman on the Forefront: Leadership and Integrity in Science (Award)
2007	University of California San Francisco Medical School/Collaborative for Health and the Environment Summit
2007	Lifetime Achievement Award, National Council on Science and the Environment
2007	TIME Global Environmental Heroes Award
2008	The Swedish Goteborg Prize for the Environment and Sustainability

ABSTRACT

Theo Colborn was born in Plainfield, New Jersey, in 1927. The area was rural, and she lived on a farm until she was five years old. Her father worked as a traveling cookie salesman. The family moved to East Orange, New Jersey, and Colborn attended the East Orange school system, which she believes was excellent. Her fifth-grade teacher, Sue Garris, taught the students all about the outdoors and was an early inspiration for Colborn. The family loved music and often harmonized together. In high school, Colborn and a female friend signed up to take the scientific course and were the only females in the science classes. After she graduated from high school, she planned to attend Rutgers College of Pharmacy, but she did not know if she could afford it. She briefly worked at a pharmaceutical company until she received a call that she had been offered a full scholarship to attend the College of Pharmacy. After Colborn earned her degree, she began working at a local pharmacy where she met her husband, Harry Colborn. They married and began working together as pharmacists, eventually owning three drugstores. After fifteen years of working together, they decided to go back to school at Colorado University in the College of Pharmacy. By then, they had started a family so the kids came along with them. Harry completed one semester before he decided he wanted to start a farm to raise beef, so the family moved. Later Colborn and her husband divorced, and she decided to pursue a degree at Western State University, desiring to become an expert in Western water quality. She spent her summers at Rocky Mountain Biological Laboratory, including sitting in on a course taught by Paul R. Ehlrich and John P. Holdren. Stanley I. Dodson then invited Colborn to do a PhD with him at the University of Wisconsin. She talks about her graduate school experience, noting it was different being an older student.

Near the end of her PhD program, a fellow student encouraged her to submit an application to the Office of Technology Assessment (OTA), a position she received. At OTA, Colborn caught "Potomac Fever" and began working on a study looking at the safety measures of chemical manufacturers. She also began studying ozone, which prompted her to consider air pollution. After her time at OTA, she was invited to write a report on the health of the Great Lakes for the Conservation Foundation. When funding from the foundation ended, Colborn received support from Environment Canada and Health Canada. She continued to receive grants for her work and began planning a meeting discussing topics she had covered in her research. She wrote a technical book and worked with Dianne Dumanoski to translate that book into a popular press book. She concludes the first interview session by reflecting on science and policy and the importance of scientists speaking out.

During the second interview session, Colborn goes into detail about her work. The International Joint Commission gave her a grant to work on a paper on the epidemiology of bald eagles in the Great Lakes. She planned a Wingspread Conference in the nineties and discusses the documented endocrine-disrupting human disorders that have been discovered since then. Colborn talks about the public reception of her work, including the popular press book, *Our Stolen Future*. While the book had some positive reception in the United States, it was better received in Japan where most people could recognize Colborn's name. Since the book did not have the impact she wanted, she believes the next strategy is getting through the medical sciences. She hopes the US will devote more time and money to inner-space research. She talks

about EDSTAC and moving the work from committees to an independent, international organization called EDICOR. When that organization took a nosedive, she founded The Endocrine Disruption Exchange (TEDX). Colborn came back to Colorado, hired some employees, and kept writing technical papers to get the message out. She sees a future goal of working toward convincing people that inner-space research is necessary. Colborn ends the interview by reflecting on self-sufficiency, the need to stop buying products full of chemicals, and science and politics. She hopes to make a movie about endocrine disruption to reach a larger audience and appreciates the opportunities she has had to speak to many people.

INTERVIEWERS

Jody A. Roberts served as the Director of the Institute for Research at the Science History Institute. He received his PhD and MS in Science and Technology Studies from Virginia Tech and holds a BS in chemistry from Saint Vincent College. His research focuses on the intersections of regulation, innovation, environmental issues, and emerging technologies within the chemical sciences.

Elizabeth A. McDonnell assisted in conducting this oral history interview, but no additional information about their career history is on file.

ABOUT THIS TRANSCRIPT

The Center for Oral History, Science History Institute, is committed both to preserving the recording of each oral history interview in our collection and to enhancing research use of the interviews by preparing carefully edited transcripts of those recordings. The preparation of interview transcripts begins with the creation of a verbatim typescript of the recording and proceeds through review and editing by staff of the Center; interviewees also review the typescript and can request additions, deletions, or that sections be sealed for specified periods of time. The Center keeps track of all changes that staff, interviewers, and interviewees make to the original typescript. Please contact us if you would like additional information about these materials. We have established guidelines to help us maintain fidelity to the language and meaning of each recorded interview while making minor editorial adjustments for clarity and readability. Wherever possible, we supply the full names of people, organizations, or geographical locations mentioned during the interview. We add footnotes to the transcript to provide full citations for any publications that are discussed, to point to extant oral history interviews, and to clear up misstatements or provide context for ambiguous references in the transcript. We use brackets to indicate the addition of material that was not in the audio, and bracketed ellipses to indicate the deletion of recorded material. The transcript also includes time stamps at five-minute intervals. We omit without noting most instances of verbal crutches and all instances of nonlexical utterances. We also make small grammatical corrections where necessary to communicate interview participants' meaning. Finally, staff of the Center create the abstract, chronology, and table of contents. With the availability of online full-text searching of our transcripts, the Center for Oral History opted to discontinue the practice of preparing a

back-of-the-book index for each oral history transcript in 2020. **The Science History Institute is committed to the responsible presentation of the history of science by addressing evidence of inequality and oppression as well as the subsequent silences in our collections. To that end, we recognize there may be language in our oral history collection that is outdated, offensive, or harmful, such as, but not limited to, the following: racist, sexist, Eurocentric, ableist, and/or homophobic language or depictions.**

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INTERVIEWERS: **Jody A. Roberts**
Elizabeth A. McDonnell

LOCATION: **Paonia, Colorado**

DATE: **7 August 2009**

ROBERTS: All right. So this is Jody [A.] Roberts. This is August 7, 2009, and this is the oral history with Theo [Theodora E.] Colborn.

MCDONNELL: My name is Elizabeth [A.] McDonnell, and we are in Paonia, Colorado. I think we should start at the very beginning and talk a little bit about where you grew up, what your family life was like, and where you were born if you want to start there.

COLBORN: Well, I was born in Plainfield, New Jersey, on March 28, 1927. That part of New Jersey was quite rural at that time, and my mother [Margaret L. de Forge Decker] and father [Theodore Decker] were renting half of a house on a big farm because the doctor told her for her health she should move to the country. That's what they did in those days. So I basically went back and lived on a farm until I was five years old.

I loved it there. I was constantly being spanked because I was sneaking off to the creek. I can always remember that. The big cannas in the walk in front of the house, having my own crow as a pet that my brother brought home to me one day. We were a very musical family. Ended up then moving closer to where I could go to a school and wouldn't have to ride a bus. That was a one-room schoolhouse too. So for my first two grades of school, I went to a one-room schoolhouse.

MCDONNELL: How many students were there?

COLBORN: Oh, I would say no more than thirty. I can picture the room now. I was never bored there, so I don't think it hurt me at all. Of course, those were tough years, and my sister, who had graduated from high school already, sort of, became more like my mother than my mother. My mother was strict, and my sister was loving and full of fun, an artist. She loved to dance. So then from there—and by the way, also while we were there, my father served on the school board in the district where we lived. So there was always this education came first type of thing.

MCDONNELL: What did your parents do?

COLBORN: My father was a traveling salesman. He was a cookie salesman. He would leave on Monday morning in his vehicle and come back on Friday afternoon. Because he worked all the grocery stores and stores like that . . . why it was so good, they were five-and-ten-cents stores in those days. He would sell these cookies by the carload and then they would put them in counters and then they'd go in and scoop them out. There are still places where you can get cookies like that. His father died when he was just starting high school, and so he could not go to high school. He had to go to work in his uncle's upscale food store. There were a whole series of them in East Orange, New Jersey; Orange, New Jersey; and West Orange, New Jersey. He was always in the food business, and no matter how tough times got, we always had good food on our table and always the best. So that was, kind of, interesting. Nutrition came first.

Anyway, let me see. Where are we now? We're back to . . . let me move to East Orange, New Jersey . . . so my brother would be closer to Newark College of Engineering, where he could go to college at night, and work in Bell Laboratories in New York City, [New York], during the day. There was a railroad track there—the Delaware-Lackawanna Railroad track—right near us. I went through the East Orange school system. I did not appreciate how good it was until I left it, but it was a remarkable school system. I think in about the fifth grade, I can remember one teacher in particular. Her name was Sue Garris, [and she] got us up in the morning because she wanted us to hear the birds sing. She was a birder. She instilled all kinds of outside things. I was thinking at the time, if Rachel Carson's book had been out and Rachel Carson had been around, we would have learned about Rachel Carson in that fifth-grade class.[1] That's the kind of teacher she was.

MCDONNELL: Maybe a little bit ahead of her time, you know.

COLBORN: Oh, very much so. As a matter of fact, when she retired, she ended up living along the Delaware River, where I ended up living after I married my husband [Harry Colborn] up in northern New Jersey. She would come in our store all the time, and we would talk birds. It was great, but anyway, it was a very, very good school system. I went back and was looking at my grades the other day because my daughter found some old boxes that were in trunks that we had moved from the East to the West, and I wasn't that good a student. [laughter] It was remarkable. Until music, of course, always music, and I had twelve years of classical music training on the piano.

My brother had a band; he was a trombonist and a drummer. We never had company . . . even if they just came in for the evening for dinner, we always gathered around the piano and we sang and we harmonized. Harmony was something you just did in the family. As we worked,

[1] Rachel Carson, *Silent Spring* (Boston: Houghton Mifflin, 1962).

we would sing or we would whistle or I'd be playing the piano, because I loved—and of course, I never had to do the dishes because I was practicing playing the piano. [laughter]

MCDONNELL: Smart.

COLBORN: Yeah, but I loved it. I truly did. I'll tell you quite frankly, if when I went back to college I had brought a piano with me, I probably wouldn't have my PhD today because . . . [clock rings] That's my clock in the back room.

MCDONNELL: Oh, okay.

COLBORN: My bird clock . . . . When I moved off to college, basically what I did—I think I supplied all that activity with my fingers into first a typewriter and then immediately into the computer because I would have been sitting there playing the piano. It was just so relaxing to sit down and play.

ROBERTS: Do you still play?

COLBORN: Not anymore. No, not at all. I can't. I have terrible arthritis in this thumb, so I don't think I could do it. I often go up to the house and try and the girls will say, "Mom, sit down and play. You used to always play for us." But it's not coming out the way it used to, not at all. Now, I guess I'm supplying all that into the computer. It was setting me up for sitting down and doing what I was going to do the rest of my life—but, [in] my high school days, I was tall, and skinny and awkward. Everybody else dated. Everybody else was [a] cheerleader, that sort of thing, but I was on the newspaper, you know. But I hit chemistry . . .

MCDONNELL: Is that when your . . .

COLBORN: Oh, that's when—and you know, botany and zoology, mechanical engineering. As a matter of fact, I was such a tomboy that—and my girlfriend and I, both of us decided that at the high school where we were going, only the boys took the scientific course. The girls then took arts and sciences or secretarial [courses]. So we both signed up for this scientific course.

It's interesting. We made it, but they thought I was a boy because I dropped the "dora," I dropped using Theodora and switched over to just Theo. So they saw Theo Colborn. I was even assigned to a boy's gym class, which she wasn't. We had to get that arranged, but that was, kind of, an exciting thing in high school. So we were, sort of, the tomboyish type that hung out,

didn't date, that sort of thing. But, I also started working when I was fifteen because we were allowed to because of the war, remember.

MCDONNELL: What'd you do?

COLBORN: It was only a short trolley car ride to Newark, New Jersey, to work at a place called Hanes—sorry, it wasn't Hanes. It was Bamberger's [department store], which is now Macy's. So every Wednesday afternoon, I'd go from school on the trolley car down to Bamberger's and work in their dress department selling clothing—and on every Saturday. That gave me about eight dollars a week, which was, kind of, exciting. So when it got near the end and time to go to college, I realized that my father, who was in the cookie business, had been pulled in off the road . [. . .] He lived on—what do you call it? Come on, help me.

ROBERTS: Commission?

COLBORN: Yes. Basically, he worked on commission. So consequently because of that, our income dropped off considerably. So I knew there was little chance that I'd be able to go to college although I had taken a college prep course. But in the senior year, I was called into the registrar's office—a woman who lived right next door to the high school.

She said to me, "Theodora, we've got to get you into college." I said, "Well, I don't think I can go. I don't have the money." She said, "Well, there's a college I want you to go look at." She said, "It's Rutgers College of Pharmacy, and they're in Newark, [New Jersey]. You can easily live at home and commute." So she said, "I'm making an appointment for you, and I want you to go down." I walked down—I went down there and I'm telling you, when I walked in, I knew this was it. It was so exciting, the things that I saw—everything that I loved. So I came back and she said, "What did you think?" I said, "I just loved it."

ROBERTS: So what were those things? What did you see?

COLBORN: Well, okay. Well, first of all we went into a chemistry lab, you know, the chemistry lab, oh, exciting. Everything, everything is set up. We went into a microbiology laboratory. Then we went into a laboratory called pharmacognosy, which was crude drugs and herbs—always my mother had gardens, and I loved flowers and I loved the outdoors. I began to see names on the shelves there of flowers that I was familiar with that really caught my attention. Then of course, the skeletons just—it was very small. It wasn't a very big building, and it had a gym with a piano in it, so I could in there and play the piano and ended up doing that.

But anyway, as it turned out, I forgot all about it because there was absolutely no money. There was no way I could go, and I heard nothing. So I applied for a job when it came time to get out of high school. I began looking for a job, and I found an ad in the newspaper for what they call a dishwasher in a laboratory. It was called the Carroll Dunham Smith Pharmaceutical Company in Orange, New Jersey. [It was] right next to the railroad track, so I could take a train there.

I called and asked if I could come in for an interview, and I went in and sat down and the woman who interviewed me was very nice and said, "Well, have you had any chemistry?" I said, "Oh, yes. I've had a year of college chemistry." But that's what it was called. I think she thought I meant a year of college chemistry. Now I realize how I must have deceived her. I wasn't doing it on purpose. Anyway, I got the job. So the minute we graduated from high school, which very near the end of June, I started working in a laboratory. Going in and cleaning up the beakers, scrubbing, using all the strong acids to clean the beakers and the pipettes and just doing basic . . . they were teaching me, right off in the beginning to do basic titrations and so I was so excited about that. I did that for three weeks and then I went home one Friday afternoon, and my mother said to me, "We just got a call. You have to be at the College of Pharmacy with a hundred dollars on Monday morning, and you just got a full scholarship . . ."

ROBERTS: Oh my goodness.

MCDONNELL: How did that happen?

COLBORN: To Vicks Chemical Company that I was chosen out of the blue, but you need this one hundred dollars. [My mother said], "Daddy doesn't have a hundred dollars, but when you were a child, you used to take a penny or a nickel a week to school and we put them in a bank account in that little one-room schoolhouse back in northern New Jersey." So we had to drive back at the bank first thing. We drove to the bank, went in, and by then it was worth just one hundred dollars. It was remarkable, now ninety-eight dollars.

MCDONNELL: Wow.

COLBORN: They gave it to me in ten-dollar bills and change. We walked out of there. My father drove like fury to get me at the College of Pharmacy. So I got there late because everybody had gone in, and they'd heard the dean talk. Then most of them had gone through registration, so they quickly slipped me through registration, and I really think they said, "Wow, she really needed the money" because I suppose everybody else came with a check. So I gave them the ten, ten-dollar bills.

So then, of course, I didn't go back to work that day. Then I had to call that afternoon, and say, "I'm going to College of Pharmacy, but I don't have a class until Wednesday, you know, and I'll be in tomorrow." They still wouldn't believe me at the Carroll Dunham Smith Laboratories, but they were wonderful people there. They nurtured me. They let me work afternoons and weekends, so that I could work my way through college.

MCDONNELL: Did you have a similar experience there being one of the only women working, or were there . . . ?

COLBORN: Oh, no. There was a woman there—my mentor—who ran the control laboratory. Basically, the job there was to test the chemicals that were coming in to make sure they were pure, that they were then going to make their pharmaceuticals out of. At that time, they were making Diethylstilbestrol**,** DES. Amazing. It is remarkable, you know, it goes right back. So that would be in 1945, 1946, 1947, when they were just beginning to compound it, learning how to make it into a beautiful pill and then terracoat it. That all went on in this particular laboratory, which eventually was gobbled up by CIBA [Pharmaceutical Products, Inc.]. But it was wonderful. They were wonderful with me; they would help me. The only subject I really had trouble with was physics. But because there were only about twelve of us in the class, they marked on a curve. So even in physics in college, I got an A, but I was probably nothing more than a C or a D student. No one else caught on either, so thank God for the curve. I managed to get straight A's. I mean, I felt so compelled that I just had to do it.

It was funny when I met the registrar on the train. She was always coming in with us in the morning, and I'm walking out there. [. . .] Then there was a woman who was a registrar at the College of Pharmacy who said to me, "You know, we never expected you to do this well. You don't have to do this well." But I felt so indebted, and I just felt I had to do it, so I did it. You know, and it was really interesting—thinking about music—we would have exams all the time. I would memorize things to music and I would sing them, and I would hum them. My mother would say, "Go to bed." [At] ten, eleven o'clock at night, I was still going through—I took very, very careful lecture notes and rewrote them, so that they would get imprinted in my brain. Then also when I went back to study, I used those. I did. I just couldn't believe how well I did. So it was remarkable. I loved every minute of it. It was really a wonderful, wonderful beginning, truly.

MCDONNELL: Did you have any professors that you felt were more inspiring?

COLBORN: Well, there was . . . yes, I think the [Eulins], who are both passed away. They're all dead now. They were all wonderful. They really were. Actually near the end, the microbiology professor was leaving to go to Yale [University], and he offered me the first opportunity as a woman to do a postdoc—well, a pre-doc, a master's degree at Yale in physiology. But I felt, having been a product of the [Great] Depression and knowing how

difficult it is, I needed to get my pharmacy license so I could earn a living. In order to do the pharmacy license, you had to work another year at forty-eight hours a week in a certified drugstore. So that was forty-eight hours a week, six days a week for a year, [and] I worked at fifty cents an hour in a pharmacy. So I ended up working in a wonderful pharmacy because it happened to be a pharmacy that an ex-dean of the College of Pharmacy used to . . . he quit being the dean of the College of Pharmacy and had this famous pharmacy that people went to.

Because in those days we made our lotions, we made our ointments. We made suppositories. We rolled those pills. We folded powders. Mixtures, we made mixtures all the time, nothing went out that wasn't mixed practically. There were very few packaged, dose-by-dose types of things that we could administer or actually sell. So you had to be an artist. I got real good at it. I think that's . . . . I don't know whether it's helped my cooking or not. I know how to make a nice, smooth gravy if that's important. [laughter]

Anyway, it was a wonderful experience and just energized the whole time, although it was a lot of hard work. Then the other thing—we accelerated because it was the war [World War II]. So we didn't even take Thanksgiving Day off the first year I was there. We didn't take holidays. We went right up to the day before Christmas and kept going. We went through the summers. So and actually, [in] two years and ten months of intense college, I did a four-year degree in pharmacy. Even then, I would have been too young to pass the Boards [Pharmacist Licensure Examination], So you know, I had to wait a year. Then you had to go take the Boards in Trenton, [New Jersey]. Then I was like, "Oh, I finally did it." I had not thought about going back to college then, because I was so excited about working as a pharmacist.

MCDONNELL: So that's what you wanted to do in terms of a career, was . . .

COLBORN: Yes. That was my goal, to be a good pharmacist. Then my husband [Harry Colborn] started stopping into the drugstore, where I was working as a pharmacist to visit another young man who was also a pre-graduate pharmacy student working there; [he was] a married man trying to earn a little money on the side, while he was working his way through college. He would stop in to see him. I found out later he wasn't stopping in to see him. He was stopping in to see me.

MCDONNELL: So that's how you met?

COLBORN: That's how we met. It wasn't long after that that I married him. He still had a year to go, so I kept working while he was on the GI Bill. He had come back from World War II. So I think now the opportunities that we had at that time; [it was] because he was on the GI Bill that we bought out first house. We bought some of this furniture that you're looking at—I don't have much left, what's out there—but we bought some of our furniture on the GI Bill.

Wonderful advantages. With him working as a pharmacist . . . and then his father had a pharmacy and wanted so badly to retire, so there we were.

MCDONNELL: So you worked together.

COLBORN: We did. Oh, yes. We ended up owning three drugstores in that county.

MCDONNELL: How long did you do that for?

COLBORN: We did that for over fifteen years. I began to get tired of our having to work because drugstores in those days opened up in the morning when the first doctor came to work in town, and they stayed open until the last doctor went to bed. They would let us know, the one who was on call, and say, "Okay. You can shut down now." Now that often meant working from 8:00 a.m. in the morning until 11:00 p.m. at night. There has to be a pharmacist in the store.

So we had all these pharmacists working for us. One night I was walking into the house as my husband was walking out. He had had supper. I prepared the supper. We did have a full-time housekeeper—those were the good old days—and lived in a big house. He was walking out as I was coming back in from having run the pharmacy, and I said, "You know, there's got to be a better way. There's got to be a better way." He had been injured in the war many times, and he had severe Ménière's disease, and he was going deaf. He felt he couldn't work with the public as much as he should. We decided well, maybe he should go back to college and get a degree as a hospital administrator. At that time, I had just started establishing the first hospital pharmacy in any hospital in the state of New Jersey and was working there on that. So we thought—huh—a hospital pharmacy. Why don't we go back to college? You know, take a year or two off, but I wanted to move west because we were losing on the Tocks Island Dam [Delaware River]. Out there, I got very much involved. I was on the school board and actually hated to leave.

MCDONNELL: So when did you have your kids?

COLBORN: Pardon me?

MCDONNELL: When did you have your kids?

COLBORN: The first child was born the day [my husband] was taking his final exam. [laughter] Then the next one came just about two years later. Then two years later, and then we

waited until ten years later and had another one. So I had a boy, two girls, and then a boy [Harry Colborn, Kristy Colborn, Susan Raymond, and Mark Colborn]. They were all raised in a home where there was a lot of music, the same type of thing, except dad was in and out. There was a lot of mixing up, but we . . . they know what work was. They're all hard workers. They're all very, very compulsive workers.

MCDONNELL: Are they all spread out?

COLBORN: They're all spread out. Not one of them wanted to become a pharmacist, although my husband—on his side, his father was a pharmacist. His uncles were pharmacists. His grandfather was a pharmacist. My daughter—the veterinarian—up in her home here on the wall of the house where they were raised, has all those diplomas. They go way back to the early 1800s from the colleges around Philadelphia, [Pennsylvania], Temple [University], and so there was this history of pharmacy in the family.

ROBERTS: And many of them went back east for their school, so they. . .

COLBORN: Pardon me?

ROBERTS: So you left the East, came out here, and most of your kids . . .

COLBORN: They went to school here. They went through the public school system here.

ROBERTS: But then they went back for their college and such at Temple?

COLBORN: No, nobody wanted to go back . . . . The oldest boy [Harry] was in a prep school in the East when we moved here. When he came home that summer and came to live on the farm, and saw what it was like out here, he did not want to go back. He wanted to stay here. It was really interesting, and it wasn't a month or two before I got a call from the school that he wasn't there in the afternoons. Where was he?

So when he came home that afternoon, usually late, you know, straggling in, I said to him, "Well, what's happening?" He said, "Well, you know, Mom, I look outside, and I look at that sky." And he said, "You know . . ." The schools were very bad here, and they still are. They hire coaches. They don't hire science teachers. They don't hire good teachers. He had been in such a good school, he was just positively bored with what was going on in the classroom. You should see his writing, his handwriting. He writes beautifully, does meticulous work that we

could talk about some other time, but basically, he was going down to the river every day and fishing. I said to him, "Where are the fish? Why didn't you bring them home?" "Well, if I brought them home, I'd get in trouble." [laughter] He was giving them to his friends for their families—that's the way it is out here. No, they all went to local colleges, except—well, I had another one, okay. But they did spread out. [My son] is now . . . he refused to go to college when the time came. He wanted to have a trucking business like his uncle's back west. So he left and actually went over to Snowmass [in Colorado], which is a new ski area, it was just starting. It was just named Snowmass, and he worked on construction there. Bought his own trucks, started building up his own business on his own and ended up with a very large trucking business over there building roads, hauling gravel, that sort of thing. Heavy—and it's called Harry's Heavy Haulers. We used to see his trucks all over the place.

Now more recently, because it's so difficult to get truck drivers who are responsible, and you're liable for so many things they can do, he now just leases the equipment and people rent it from him. He's also a distributor for some of the larger equipment companies. So he's doing extremely well—and fishing, still fishing.

MCDONNELL: Now he has time.

COLBORN: He likes his fishing, and he doesn't want his environment touched. He wants his views and so he's, sort of, caught the dichotomy of development and earning his living off of the development and the destruction of the West. That's his life.

MCDONNELL: Did all your children inherit your passion for saving the environment?

COLBORN: Oh, every one of them. They're outdoor freaks, truly. I mean, it's all I can say. You know, everything is the outside. I have one now living in Dallas, [Texas]. He—well, anyway, so they're around the country.

ROBERTS: No, I am curious, so you've got one that's a vet, one that started his own business . . .

COLBORN: Yeah.

ROBERTS: And what about the other two?

COLBORN: Okay. Well, okay. So the other boy [Mark], the youngest one, when he graduated from . . . when he got to his junior year in high school here, he was so bored. Now, through four . . . we were told that he would never be college material here when he started school. They didn't have any kindergartens. I didn't even know it when we moved here, so we had to wait a year to get into first grade. Anyway, so I became a 4-H leader to basically enrich my children's experiences.

So the one daughter immediately went out and bought some sheep on her own and then went to an auction, all by herself, ten years old. Walked up to the auctioneer and said, "I know these are called ewes. They're bringing them off now. The ranchers don't want them because they've got crooked teeth. There's something wrong with them, but can I have two? If they buy some, could I have two?" So already wheeling and dealing. [laughter] Everybody was fascinated, so that the auctioneer asked all the sheep men who were bringing in hundreds of sheep at the time running them through to sell, said, "Would you rather help out this little girl?" Everyone said yes.

So when the sheep came through she finally said—they said to her, "Now do you want to go down?" I wish I'd been there. But she went in it because she had been studying, she knew what to do. She checked the mouths of the ewes to make sure that they still had good teeth, that their teeth weren't run down so that they could . . . she checked their udders, their back to make sure they didn't have any kind of mastitis. She checked their legs. She felt their loins. She knew that you need a big wide loin on a sheep. She had taught herself this. This is a ten-year-old reading about sheep. She had decided . . . but she always did things like that with animals. Back east, we had a horse, and she was the only one who took care of that horse. She's the one who hauled the water, you know. She was the one who learned to ride it and do everything with it. So I had to go back down with the truck and pick up these two sheep and bring them home. That was the beginning of her 4-H project. Isn't that amazing?

ROBERTS: Yeah.

COLBORN: Which led to amazing things, because and we went on . . . well, through that 4-H project she became a national winner in sheep. Then my son with his photography and with entomology became a national winner again in 4-H in photography and entomology. He has now a collection of butterflies. This is the pilot who is living in Texas, the helicopter pilot. He has a collection at the Peabody Museum in Yale of the most complete collection of Colorado butterflies there is. On top of that, he has an example of what is called *Punctuated Equilibrium*. I'll never forget the day I was working in the kitchen on the farm, and he had been out riding on the Honda 70 with his irrigation shovel going around to irrigate for me and went down into a draw and came back in the house so excited, "Mom, where's my butterfly net? Where's my butterfly net?" I said, "What's the matter?" He said, "I know I just saw a White Admiral Viceroy Cross. I know I did." I said what? He said yeah. I said, "How do you know about—how do you know this?" "I just know it, Mom."

He went back out and collected a couple of butterflies. We hopped in the car, went over to see his 4-H leader, and they couldn't believe it. This was a very, very, very well-educated entomologist, he and his son. Immediately, [my son] collected a few more, but basically, what he showed was you can, overnight, interbreed and get a new species. That picture of punctuated equilibrium, which according to [Charles R.] Darwin would take centuries, basically took place in our back pond. So that's there, that's the kind of—when he does things . . . again, my kids when they do things, they do them well and pour their heart and soul into it. Anyway, so that's, kind of, exciting.

Then what he just—he decided . . . he had braces on his teeth, he had a little [Volkswagen] Beetle, and he had to drive to Grand Junction, [Colorado], that trip. It was a different road than it is now to go down to Grand Junction to get the orthodontist to fix his braces. While he was down there, he went to what is called Mesa State College and went in there to see if he could possibly do his senior year of high school there, so that he wouldn't have to sit through the nothing that they had to offer at Hotchkiss High School. I mean, I'm saying this—this is all going on tape—but people need to hear this, because this is what's going on here today in the rural communities where you have this mentality of what's good enough for me is good enough for my kids. We want our sports. We want to watch our kids play football, rather than really pour money into laboratories and that kind of thing. Anyway, as it turned out, they accepted him.

Then when he came home, he had to go down to the high school. The principal said to him, "You can't do this. You cannot do this. We can't have people leaving us. We'll lose that three hundred and fifty dollars a year we get from the state. We can't possibly have you doing this." So then mother had to go back down. I said, "Well, he's going to do it." [The principal] said, "All right. Then he has to sign a contract." So he could not come back to come to Red and White Day. That's an all-day day when they play games and have tug-of-wars, you know, and bash each other. He couldn't go to the prom, and he wasn't allowed to go to the graduation. Isn't that amazing? That's the kind of thing . . . so anyway, basically what happened was he finished there. He started Mesa College. He got himself a degree in criminal justice because his joy during high school the last couple of years was to ride around with the police at night and the sheriff. So I always knew where he was. He wasn't dating. He was helping . . .

MCDONNELL: He was able to do that?

COLBORN: Yeah. They loved having him along. He was so interested; here's a kid with a radio set, you know. [. . .] He just wanted to learn. So it worked out really well. He got a criminal justice degree, and he wanted to become a helicopter pilot like my brother, who was vice president of Sikorsky's [Aircraft] and developed one of the latest models. He's a very famous helicopter pilot, anyway, and [my son] wanted to be a chopper pilot. So I started paying for his private pilot's license, which he basically got. He got his fixed-wing license and he did . . . between the two of us because by then I was back in college. I was trying to pay my way through college. But he decided to go in the [United States Army], which just broke my heart,

and there are a number of reasons why he did that. Anyway, he did it. He went in for five years. While he was in the college then down at . . . he did a stint in Korea and of course, he came out—what did he come out at? Warrant Officer, Chief Warrant Officer, whatever. He came out with that, but also while he was there, he went ahead and got a BS in aviation management at Texas Tech [University].

ROBERTS: Wow.

COLBORN: So while he was in the service they had him then working as a liaison with the college, trying to get more men to do this. Do this on your time off—that sort of thing. Isn't that interesting?

MCDONNELL: Yeah.

ROBERTS: They seem to have somehow both—or it seems like all four of your kids took the entrepreneurial and science spirits of you and your husband and found different ways to exploit them, whether it was . . .

COLBORN: Yep.

ROBERTS: Becoming vets or starting their own businesses or starting their own businesses that . . . at ten years old and getting sheep. It's pretty amazing.

COLBORN: Well, it was. Well, you know what happened with that. Then we ended up . . . then we went to the Hotchkiss's, [. . .] very, very famous, very lovely, wonderful respected people. [My daughter] went down to them and she said, "I want to raise sheep." He said, "Look, Susan. It's too late for you to get a thousand sheep like we have, you know, and run them. What you need to do is help us make . . . build some good bucks. You know, the male, that buck that you put out with those females is what determines the quality of your flock. So what we need are really good bucks. You go out there and you breed me some good, tall bucks with their feet off the ground like the good old Hampshires [a breed from England], the way the Hampshires used to be." He said, "We'll buy your bucks and you'll be in business. You can do that up in your place." Because we were raising our own hay, I mean, I was out there planting seed, doing my baling, you know, all the stuff that had to be done. I was operating this small farm. Anyway, so that's basically what she did. Then she—all the while she was going through college, but we drove around the country; we looked for the best breeding stock we could buy through her 4-H project.

She built that 4-H project up so that by the time she was a freshman in college, we were already then . . . we started to sell at the National Ram Sale in Salt Lake City, [Utah], for the quality of our Hampshires. We took the Hampshires and renamed our farm, "Hamp Born Ranch." We were in operation from that. Basically, that's what she did.

All through those years of undergrad and grad school, I took care of the sheep. I was the one who was up from the beginning of January through until March during lambing. She would come whenever she could help. You breed early because you want your animals born . . . if you're raising stud animals, you want them as big as possible by September when the sales come in. So you want as early in January as you can get them, so we were lambing in the middle of the winter. I was up every three hours around the clock with those animals. Her brother helped; he was there on the farm. That gave him a chance to drive the truck and do all the things he wanted to do. He could stay up till 11:00 p.m., so mom could get some sleep between 5:00 p.m. and 11:00 p.m., so I could get my sleep in. Then he would come in and say, "Everything was fine." If there was any problem, he would let me know before he went to bed. Then that gave me a chance then to sleep through to one o'clock. So between the two of us and Susan, we did it because my husband, at that time was working as a drug inspector, and he was on the road traveling. He didn't have any part to do this. This was not his. He bought the place because he wanted to buy beef. That's why we moved there. After a month, he realized that he didn't like to ride horses, and he didn't know he was afraid of cows.

ROBERTS: So I was going to ask if that—so you get fed up and you leave New Jersey, but why this area? Why . . . so is it just because he thought he was going to raise cattle or . . . ?

COLBORN: No. No, because we went to Colorado . . . we were accepted at Colorado University at the College of Pharmacy because there were no schools for hospital administration at the time. They gave us the best offer and we were just fascinated with Colorado anyway. As we traveled, we traveled around the country, when we went to Ames, [Iowa, site of Iowa State University]. We visited colleges of pharmacy across the country thinking, "Where do we want to go? Where would we like to live?"

MCDONNELL: Is that undergraduate or graduate?

COLBORN: Pardon me?

ROBERTS: No, when they were going back, so this was when . . .

COLBORN: Well, when we had our pharmacy . . .

MCDONNELL: Oh, okay. I see.

COLBORN: Back in New Jersey, when Happy was four years old. He was then four years old. So it took us three years. We didn't even tell our families because we knew that we were thinking about moving west, but we made this one trip. We got the first Volkswagen that ever came into the country. My husband saw an ad in *the New York Times* where this Volkswagen was for sale. A neurosurgeon from Germany had bought this. His son had just got—finished his neurosurgeon residency. He and his wife . . . and this neurosurgeon were going to travel the United States. They had this custom-made Volkswagen sent over, all in mahogany inside, you know, and you could open the top and—a terrific thing—put a tent out the back.

So my husband decided, "Well, you know, I don't know whether I want to do this trip or not. It's going to cost a lot more money than we can afford if we're going to . . ." Because we were going to do this eight-week trip and do the West. We just decided we were going to go and leave those drugstores and do it and get our vacation. So we took three of us, three of the kids with us, and we left one home with the two grandmothers who were still alive at that time, the young boy. Then we toured. When we got through, they just loved us at the University of Colorado; they'd love to have us back. [They] would waive tuition, you know, put us on as TAs, teaching assistants. I could start taking courses, and my husband [could] too. So he signed up and came out ahead of me. I was left with selling the last drugstore, and getting Hap off to—back up to prep school and making the final move. So I didn't get out here until December, right after Thanksgiving, and drove into Boulder, [Colorado].

The next day, they had a Chinook. I looked out on the street, and my kids were out there on the street with roller skates with their coats like this, going by the house so fast with the wind blowing on them. I could see barbecue grills blowing down the street too. I thought, "Oh, my God. I've got to get them in the house." That was our first experience with the winds in the West. It was quite an exciting thing. Anyway, but [my husband] did not like it there. He hated it, and he didn't like going back to school. He just did not want to go . . .

ROBERTS: So how long was he there?

COLBORN: He did that first semester. Then I started taking courses in January. I took German and Manufacturing Pharmacy. I understand I got the only A that had been given in years in that course. It was so simple. [laughter]. I mean, what's so hard about that? Anyway, I was very bored. But what happened was he just got so tired, he just quit near the end. He didn't want to take his finals. He took off. He said, "I heard that life on the western slope is entirely different, and I've always wanted to raise beef." When he was in England and crashed a couple of times over there, he loved Yorkshire pudding and the roast beef, you know, and his mother always cooked it for him. His family was English. He was going to raise beef, so he took off. He

left—[he was] gone four days and came back and said, "Now I picked three places. You have your choice."

MCDONNELL: So did any of you have experience with farming before?

COLBORN: Well, I had been raised on the farm just a little, but no. No.

COLBORN: But I loved it—I loved it when we got here. It was such an entirely different life. We had some of the most beautiful vegetable gardens. We had eight acres of orchards on the place at the time, slowing building up the sheep. We got sheep. Then Harry, the oldest one, wanted pigs for 4-H. Happy was too young. Kristy also got sheep, the older daughter. The one, by the way, who is a special ed teacher. [She] has been teaching. She went to Alaska to teach when she graduated after she got her first degree. She has now a master's in science and a master's in special [education], and she is one course short of getting her PhD in special ed.

MCDONNELL: Oh wow.

COLBORN: Yeah. She taught in Alaska. When her father passed away, he, in his will, said he wanted her to come home and operate the farm and take over the estate. So she had to do that. She came back here and then she decided to stay.

ROBERTS: When was that?

COLBORN: That would have been in 1983.

ROBERTS: So she still . . . so the original house on the farm, you still . . .

COLBORN: It's still there, except that. . .well, then what happened, it turned out that Susan ended up getting—the veterinarian—ended up getting the place.

ROBERTS: Yeah.

COLBORN: We were with the kids. Well, we don't have to stay with the kids. But anyway, they all turned out to be quite individual.

ROBERTS: So it had to be interesting because you were going back to school at the same time your kids were also in school.

COLBORN: Yeah.

ROBERTS: Was that odd for you, or odd for them . . .

COLBORN: No, they were sending me . . .

ROBERTS: Or odd for both?

COLBORN: Care packages. [laughter] By the time [. . .] I managed to get to Western State [University], and that's a wonderful story, because I ended up going to Rocky Mountain Biological Laboratory. The first thing I did was when I found out that they would accept me at a college—and I could have gone to Colorado University, Colorado State University, or Western State—I decided, well, at my age and after all these years . . . and everybody would say, "And all those smart kids, how are you going to keep up with them?" So that's when I decided to go to Western State. Also, I could keep my job as a weekend pharmacist here in this drugstore for the pharmacist who runs the pharmacy, so I had an income. Also, I was doing pharmacy consulting in a nursing home. That was . . . . Medicare started and they needed pharmacy consultants. That gave me cash.

ROBERTS: How did you pick a program?

COLBORN: Pardon me?

MCDONNELL: How did you decide what to go back to study?

COLBORN: Well, okay. When I went back to Western State, I had one thing in mind, and that was from my experience working on the farm and irrigating land that never should have been irrigated. Then [I had] this wonderful appointment by Dick [Richard D.] Lamm to become a member of what he called the Colorado Natural Areas Program. It was a program that he set up to try to set aside and protect a lot of Colorado's natural heritage that's not on national public lands but also to protect what's on public lands. Boy, was that the most exciting thing. By the

way, that happened—that appointment came a week after I walked off the ranch and was up here living alone. Again, why? You know, why? The whole, the whole thing. There we met every month. I had to go to Denver, [Colorado], every month, and they'd fly me over. I'd drive over. I began to meet all the top scientists, all the people that I always wanted to work with, the conservationists, the wildlife biologists, the botanists. Oh, I always wanted to learn, you know, the biota around here. It was so . . . the mammologists. It was so exciting.

That's when, basically, I had to decide, "What am I going to do?" When I got this very small settlement from the divorce, I didn't want to touch it. The man asked me, "Well, what do you want to do? You've got this money. You're asking me to invest this money for you. What do you want to do?" I looked at him, and I had not thought of this prior to this, but I looked at him and it all seemed to come together. I looked at him, and I said, "I want to go back to college." He said, "Do it." Do you see a cobweb?

MCDONNELL: Oh no. There's a little spider. I just didn't want it to fly in my face.

COLBORN: Oh, I'm sorry. [laughter]

MCDONNELL: Oh no. That's fine. I'm just going to let it go.

COLBORN: Okay.

MCDONNELL: Just moving it that way.

ROBERTS: Create a little wind.

COLBORN: They do bite.

MCDONNELL: It's going over there.

COLBORN: They do. I'm surprised, because I have a . . . . I'm sitting on a big bunch of lavender that's piled . . .

MCDONNELL: Oh yeah.

COLBORN: The spiders don't like lavender. Anyway, so basically, it was that. So there I was stuck in Denver at a Colorado Natural Areas meeting. Couldn't get back because of snowstorms. Nobody was going anywhere. I called from the hotel room. I started calling around to all these people that I had been working with and said, "Hey. Would you take me back at college?" [They said,] "Oh my God, yes. Oh God, we'd have you in a minute. Oh, you got . . . this is great." So then I had to make up my mind. By January, I decided I'd go to Western State. Then I can do Rocky Mountain Biological Lab in the summer.

MCDONNELL: When was that?

COLBORN: And that's what I did. Hmm?

MCDONNELL: Nineteen seventy-nine or so. Is that around there?

COLBORN: It was the summer of . . . it was the winter of 1978 that I started, so 1978, January, at Western State. Of course, they said, "Well, you'll have to come back, of course. You're going to have to learn computers. You have to prove to us that you can do computers." Is he [the spider] coming back?

MCDONNELL: Oh, he's right here.

COLBORN: Let's kill him because—no, because when I get a spider bite—oh, there it is. Oh, and those are the ones that really make me swell up.

MCDONNELL: Well . . . oh no. [. . .]

COLBORN: Oh, he got away. Oh well.

ROBERTS: Maybe slipped right down . . .

COLBORN: I think he probably is not going to sting me. Anyhow, so that's . . . it just all came together. It was marvelous. Then I immediately got a hold . . . oh, then one of the teachers at Western State College, one of the profs there, Rick [Richard E.] Richards, was also the director of Rocky Mountain Biological Lab. He said to me, "Oh God. You've got to come up there." He

said, “This, you’ve got to do it.” I said, “I won’t have to irrigate. I won’t have to do . . .” You know, the farm—I never got off the place in the summer. You had to irrigate morning and night. I’m going to go up there, and I’m going to learn the names of those wildflowers. It was so exciting. So I went up there, and I lived there in the summer, and then I rented my little house out in Gunnison, [Colorado], to students during the summer. Basically, I didn’t rent it to anybody. It was a flophouse for scientists going east and west and students coming through. I could go down there and work. It worked out real well.

ROBERTS: So talk about your time at Western State.

COLBORN: So at Western State I worked with a man by the name of Dr. Martin Appley, who sat me down and looked at me seriously and said, “Well, what do you want to do? What are you coming back for?” I said, “I want to make change.” [He said], “Well, that’s good. Well, what do you want to work on?” I said, “I am so concerned that we . . . right now, and even today, nothing has changed. We fight over who owns the water, whose water it is, but no one pays any attention to water quality. I want to become an expert in Western water quality. That’s why I’m coming back to college, so that we can make change based on good science and see what we can get done.” He looked at me and he said, “Good. I’ll help you.” And he did.

So he opened my eyes up to the fact that there is soft money. I had no idea what soft money was, you know. But I began talking about . . . he said, “Well, write me your dream program.” Of course, I was talking about, “Well, I want to collect insects above and below mines, and I want to measure how much of the chemicals are building up in their exoskeleton, these toxic-trace metals.” “Well, great.” I said, “Yeah, but where am I going to get the money to do the chemistry?” He said, “Well, we’ll send it off to a lab.” Yeah. Then later on he tells me, “Well, we’ll just write a proposal, and we’ll get an atomic-absorption spectrometry here on the campus.” So you know, it was all that sort of thing; I had no idea this kind of thing was going on, and this is how people lived on campuses, and they got their salaries paid while they were doing their research. It was quite—it was a very, very enlightening experience for me.

One thing I did learn was that I may have been with a lot of very, very bright kids, but I had the ability to focus. I had a reason for being there, and these kids were not focusing. So you know, it was no . . . it was very easy to stay, if you’re marked on a curve, at the top of the curve. It was. I didn’t find the work that challenging. I found it very, very exciting. The two courses that I really was worried about were computers, which even today . . . . I mean, I let everybody else do it. I just do what I have to do, just tell me what to do . . . it’s like my car. I don’t want to know anything about it. I just wanted it to go when I go, and I wanted to do it without polluting and using any gas. I got my wish. [laughter]. Now I have people who do that work for me. So I barely got through the computer stuff, believe me. But, I made it.

Then the biochemistry was the big challenge. I found out that the final exam was basically a national board exam, and I never did get it back, but I was told I ended up in about the ninety-fifth percentile. It was nerve-racking, but I got through that. It was just like, “Oh my

God. I made it." Then I was able to keep going, but all this time I was also serving on the Natural Areas Council, attending those meetings. Going out with them and doing the wonderful field trips where we could see these areas, get into these parts of Colorado that no one would ever get into, such a privilege to be able to serve on a committee like that.

MCDONNELL: Did they approach you or did you . . .

COLBORN: No, Dick Lamm appointed me to serve on this.

MCDONNELL: Oh.

COLBORN: And that probably came about because prior to my going back to college in the mid-1970s, if you will remember there was a big crunch to develop coal. The BLM [Bureau of Land Management] had been told to issue permits to anybody who wants to dig coal. If you drive up this valley . . . if we have time I could take you up and just show you what's up in there. And what we discovered is, of course, coal has to be washed before it can be shipped. There's just a lot of things involved. There was a plan to gasify coal up the valley. One of the young people that I was working with, we started a—in 1979, basically—started finally a very highly active and very effective group called the Western Slope Research Council at that time. [phone rings] I'm going to let the phones ring.

ROBERTS: You're going to let it go?

COLBORN: We're going off on terrible diversions.

ROBERTS: No, this is all great. This is all the wonderful background, so this is why it's a full oral history. We want your . . . the whole life perspective.

COLBORN: So let me see. So basically, it was because . . . so it was Marty Appley who made this all possible for me. I really do, [. . .] he was just wonderful. Then, but the problem was . . . and of course, those summers at Rocky Mountain Biological Lab, all I could think was that how privileged I was. Oh, if anything, if each one of my children could have that experience or every child, we would be living in a different world if more people were exposed to that kind of . . .

MCDONNELL: Were there lots of people researching with you?

COLBORN: Pardon me?

MCDONNELL: Were there lots of other people there?

COLBORN: Well, no. It's not very crowded. We all live in old cabins that are well over—oooh, this was an old mining town that Rocky Mountain Biological Lab bought back in 1928 when I was born, and it was abandoned then. So these are old cabins that are . . .

MCDONNELL: Oh, okay.

COLBORN: Well over a hundred, hundred-fifty years old. With NSF [National Science Foundation] money, they're gradually getting them rebuilt, but they're still rustic. I mean, you sleep on a cot, you know, with ticks, and the bats share the ceiling in the cabin with you. Are you getting another spider?

MCDONNELL: Yeah, it's right there.

COLBORN: Just kill it for me, please.

ROBERTS: Yeah, I will.

COLBORN: If you just—mainly because I am so . . . okay, you don't want me to get a bite while you're here, because . . .

MCDONNELL: I got it.

COLBORN: You'll lose me. I'm not kidding you. That's how I react anymore to so many things.

MCDONNELL: You can be the spider killer.

ROBERTS: I am the spider killer.

COLBORN: I've been stung by a scorpion twice, but we won't get into that.

MCDONNELL: Oh my goodness.

COLBORN: That's what's got me so sensitized, I'm pretty sure.

MCDONNELL: Wow.

ROBERTS: Wow.

COLBORN: Anyway. Basically, it was just such . . . then there was a woman there that first summer. Her name was Dr. Svata [M.] Louda. She was an economist who got very interested in entomology and competition. All of her research is based on beneficial insects, the competition between beneficial insects and harmful insects and plant competition, and [she is] an excellent statistician. That she, that summer, made me appreciate statistics. She made statistics fun. She got me over that tremendous fear. I said, "How am I going to do statistics?"

Then the other most remarkable thing that happened was Paul [R.] Ehrlich and John [P.] Holdren were teaching a course there that summer. They only had four kids in their class that they were teaching. They would take us for a morning, and they allowed me to sit in on this class. I kept thinking, "Oh my gosh. What a privilege. Thank God I don't have to be tested in this class, because how am I going to deal with this?" Because you know who Ehrlich is and you know who Holdren is . . .

MCDONNELL: Well, you could just give a little background for me . . .

COLBORN: Well, Paul and Ann [H.] Ehrlich—Paul, basically, was the butterfly man who got into populations and wrote *The Population Bomb*, all of their books are up here on the shelf, wonderful books, good work, but all based on large databases, big numbers, statistics.[2] Also and then John Holdren, who I think probably was taking some courses with him—I don't know that worked out—but John was with him. John is the physicist from Harvard [University] who is now [President] Barack [H.] Obama's personal science advisor.

[2] Paul Ehrlich, *The Population Bomb* (New York: Ballantine Books, 1968).

MCDONNELL: Wow.

COLBORN: So here I am working, sitting in on a class. We're all sitting around in a small little cabin, and I had never seen anybody teach the way they taught because they would just flip up a slide, you know, just one slide on the screen. Then they would talk. It was so interesting, and they would tell stories. They brought you into this. [clock rings] We've been talking an hour already. There's my clock again. Do you want to stop?

ROBERTS: No, no.

COLBORN: Okay. Anyway, it was very interesting. I came out of that course realizing that this is what I want to do. They think about everything from the big picture. I'm not a reductionist. I began to understand where I fit in everything. I said, "You know, I can do what I want to do. I know I can do it now between Svata and, actually, Paul and John." I think through that summer . . . and I do have to say, John's son, who was only ten years old, helped me climb the mountains to get my equipment up the side of mountains, and then helped me collect the invertebrates, the little things that live under the rocks. He would get a penny an invertebrate. He was making big money by the end of the day because he's so fast. He could just skim through a stream and turn over . . . . I was barely clinging to the side of the mountains. You should see where we went up on the sides of the mountains that we climbed to get this stuff. It was Craig [Holdren] helping me get my insects. I think of all of this coming together, but it's a great story.

ROBERTS: That's fantastic.

COLBORN: Then there was a Dr. Stanley [I.] Dodson there that I took my course under that summer, who then invited me to come out to do my PhD under him at the University of Wisconsin because he felt I should have got a PhD for my master's degree. He felt that he needed me because he's such . . . he's a shy guy. He hates doing lectures. He doesn't like getting up in front of people. He said, "we need somebody who can talk. I want to get you out here." He said, "I don't want you to come out here and have to memorize every little hair and siti on an invertebrate. I'm going to put you through what is called a distributed course." So it was in this zoology department at the University of Wisconsin, but it was a distributed minor in epidemiology, toxicology, and water chemistry. It was—see that all seemed to just come together. It was that very, very good training that I got under Marty Appley and a number of other good teachers at Western State at that time. Then also that two-summer experience at Western State College, I think combined with the work that I was doing at the Colorado Natural Areas Program. Also, I was putting on summer workshops at Western State College in the summer.

MCDONNELL: Wow.

COLBORN: Every summer we would pick a major topic. One of the very first ones I took was ground water. It was the first conference ever in this country on ground water. My last one was on acid rain in the West. That was the year after I had discovered acid rain up in the high altitude streams when I was measuring the pH of the water. The thunderstorm would come along and the pH would shift to about 7.8 down to a 2.3 or 2.4, just like that.

ROBERTS: Wow.

COLBORN: Then go back again. I kept talking . . . you know, the mobilization, every time that acid rain hit, what was moving downstream from those mines they were working in. So that was the kind of thing that I got involved in. Then there was another young chemist who worked with John Harte, who is also out at Rocky Mountain Biological Lab, who helped me develop a way to measure . . . in other words, I could run a liter of water in the field through a separatory funnel down through a resin column and then one drop—eleven drops in a minute . . . and then just take that separatory column back to the laboratory. Then later elude out all of those elements that clung to the resin in the column, which was very much like the exoskeleton on the insects. Basically, that's where we . . . they're polymers. Then [I would] be able to measure what was in the water, where I was collecting my insects. That was a whole new kind of thing, but it came together, always because there was somebody there with just the kind of talent or the interest that I had. It wasn't all because of me. It was because of a lot of people and timing.

ROBERTS: So the choice when you went to Wisconsin—so you went right away after you finished the degree at Gunnison?

COLBORN: Basically, I stayed back a year, so I could finish—I wanted to finish a course of calculus, which I had never taken, which didn't help after all anyway, you know. But I wanted to do that. There was a break in there for one year, because I felt I had to do that. I still am sorry now that I didn't go when I should have.

ROBERTS: So the choice then around the epidemiology, toxicology, and water chemistry as the distributed minor. This is the interesting thing about Wisconsin, right, that they—all of the PhD students have to take minor subjects as well, that are away from their major focus, right, but yours was actually a way of folding in this prior experience . . .

COLBORN: Yes.

ROBERTS: This is what Dodson wanted you to do, right?

COLBORN: Do, that's right . . .

ROBERTS: He wanted you to fold in your previous experience, so that you could more quickly move through the PhD, is that right?

COLBORN: That's right. That's what he did.

ROBERTS: So how did you change the project once you got to Wisconsin? The project was so focused on the living condition of Colorado, and now you're in Wisconsin, so how did you . . .

COLBORN: My committee made me focus. So to finish my PhD, I had to do this crazy little study based on weight and mass and concentration. It's very, very elementary, basically to prove to them that I could focus, and then write a final paper. My thesis was made up of a series of publications in scientific journals. We put them all together. Actually, before I had my master's degree, I had one on Molybdenum in an elegant little paper which was so easy to write.[3] It was so simple to write.

I submitted it to *Chemosphere*, and it came back, and all I had to do is change a few words. They said, "This is great. Send us some more." [laughter] I thought this was easy. I thought it was going to be real easy. I go back and look at that now, and that was an extremely focused paper and they wanted me to come back and do one more focused thing, which I did.

ROBERTS: So still using a lot of your data from the thesis work from Colorado.

COLBORN: Yeah, I kept writing. I had data that hadn't been done. We were still running things through analyses. They were going to start running—they were running things through for me in an entirely different way of measuring trace elements out there in their lab. I was still taking . . . . I also had insects that I was drying when I went out there and ashing and still getting assayed. I had all that work to take along and finish.

[3] T. Colborn, "Aquatic insects as measures of trace element presence: cadmium and molybdenum" (master's thesis, Western State College of Colorado, 1981).

ROBERTS: So how long were you at Wisconsin?

COLBORN: Two years and ten months.

ROBERTS: Two years, ten months.

COLBORN: Just like my pharmacy, I was thinking about that. It was the same kind of thing, the pharmacy thing, so at the end, the same thing. I didn't even stay for graduation. I rolled out of there because I had all . . . see, what happened then, in November just before I was to graduate . . . well, if I was going to pass my PhD, it would be the following spring. One of the students that was in one of the courses that I had to teach came up to me and said, "I worked at the OTA for a while in Washington, the Office of Technology Assessment." She said, "You need to be there." She said, "Here's an application. You have this weekend to get it done." Here's this little . . . her name is Iris Goodman. She's about five feet tall, and she's standing there telling me this, that I must do this. Iris said to me, "You have to do this." Now I said, "Iris, I've got to finish my thesis. I have to have my thesis ready by the end of the year." She said, "You forget your thesis. You do this. Look at this thing. You've got fifteen hundred words to tell them why you should work at the Office of Technology Assessment."

ROBERTS: What year was that?

COLBORN: That was . . .

ROBERTS: Nineteen eighty-two?

COLBORN: Nineteen eighty-four.

ROBERTS: Nineteen eighty-four.

COLBORN: So 1984. Anyway . . .

MCDONNELL: You filled out the application.

COLBORN: So I did. I sat down, and I wrote this thing and rewrote it and rewrote it. She took one look at it like a couple days later, and she said, "It just needs a tweak here and a tweak there." She reviewed it for me. She tweaked it. She gave it back to me. She said, "Now finish up all the rest of it that has to be filled in and get this in." So I submitted it and basically forgot about it. Just about the middle of March—I still hadn't done my defense—I got a letter or a call, I can't remember now what it was, but somebody called. I guess it must have been a phone call first, followed with a letter with the instructions that I had been one of the finalists. I had to come to Washington, DC, and guess what? On March 28, my birthday. Isn't it amazing—my fifty-eighth birthday?

MCDONNELL: Goodness . . .

COLBORN: And I'd never been to Washington, DC, in my life, all the years I lived in the East. They paid my way, and they put me up in the Mayflower Hotel. I was just taken aback with the beauty. It was cherry blossom time.

ROBERTS: Yeah, right.

MCDONNELL: Yeah, it's beautiful.

COLBORN: Everything was pink and crystal chandeliers, gorgeous pastel Chinese rugs, gorgeous, beautiful. Everything was beautiful. Of course, I worked . . . they also told me when I got there that I had five minutes to defend myself in front of the Board that would review me. They said, "And you'll get five minutes, and you won't get more. It has to be very, very perfect."

Then a very dear friend of mine—he's become a very dear friend. [He] was a medical doctor who became so disgusted with the medical profession and felt that every medication he gave a patient made them sicker that he decided he would go back to college and study pharmacology—toxicology was the answer. He was back working in toxicology, stress situations, and other—what are all these things that come together that make you sick? He was working in the Tox [Toxicology] Department there . . .

ROBERTS: Who was this?

COLBORN: This is Dr. Roy Ozanne. He happened to be at Rocky Mountain Biological Lab that first summer that I was there.

MCDONNELL: Wow.

COLBORN: We also bonded as well because he was so interested in my low-dose research. We would sit around and talk, tremendous discussions about the work, and his contribution to my thinking and making me think was just tremendous. When I get back there . . . so here I am finishing up at Western State, I end up out there. So who signs up to take a course under me, but Dr. Roy Ozanne. I had to teach limnology. I got out there and here was a message on my desk to get over to the boathouse and learn how to use the . . . it was a boat, a tugboat type of boat. I'm trying to think. It was like a shrimp boat that we had to use on the lake to take the students out on Lake Mendota to teach them limnology. Now, limnology is the study of fresh water, so I was one chapter ahead of that class through those years when I was teaching limnology on Lake Mendota. But it was there that he signed up for that course, so we were surprised to see each other and pleased. Then I got to know his parents, so they were like a second home for me in Madison, [Wisconsin], a family again. But Roy followed my work, so he was there.

He was the one who drove me to the airport. He kept making me say over and over again, "Now tell me what you're going to tell them. Tell me what you're going to tell them." He would stop me and say, "I don't think that's the right word. I think you need to use this word. Okay. Let's go back and start over." I had that thing down in my mind. It was really funny because two of the other people who came in to compete—they were all young people. I mean, I was the only aged person there. Two of them said, "Well, those people are crazy [if] they think I can tell them my research in five minutes. They're going to get a good report from me." Neither of them were accepted.

MCDONNELL: Do you remember what you told them?

COLBORN: I could possibly do it if I had to.

ROBERTS: Well, you don't have to do it word-for-word . . .

COLBORN: No, no, no . . .

ROBERTS: What was the pitch?

COLBORN: No, no, no. I had to tell them the kind of research I did and what I found. It was very simple.

ROBERTS: And you got the position.

COLBORN: Yes, I got it. I was accepted. Then of course, I didn't have to worry about it, but I got that acceptance—this Congressional Fellowship—before I'd even done my orals and defended my thesis, basically. I always said that my committee had to let me through. Yeah, because there's a very interesting story with my master's degree too.

One of the professors who was on my committee gave my thesis to Amax Corporation, the company that was trying to get molybdenum out of the mountain above Crested Butte, [Colorado]. They had . . . . I saw their representative bringing that back into the building and giving it to that professor. I was very upset about that, because that's a very confidential thing, when you have someone's thesis. I felt that I had been terribly violated. So when I went for my defense, I went in, and we sat down. We talked a little bit. Then this professor said something to the effect, "Well, how am I to defend your thesis in front of my associates?" My committee members all looked at each other. He said, "Well, we're your associates." He said, "Well, my associates at Amax. These people I'm doing all this contract work for." That's where they asked me to leave the room.

ROBERTS: Wow.

COLBORN: About an hour later, I went back in, and I only had to say one or two things, and they gave me my thesis. Again it was like, what is this diversionary tactic? My committee felt they'd had to do this for me. Again, I was older than everyone on my committee, just as I was at the University of Wisconsin. I've always felt that I did everything the easy way.

ROBERTS: Well, so talk a little bit about before you get to your time at the OTA. What it was like being older than some of your professors and coming with this really rich background of experiences from . . . ? You know, you ran successful business, you had this training in pharmacology, you had this experience running a farm, and all these things were coming together. You were squishing them all together in this fascinating way. And you're a good ten to twenty years older than, perhaps, some of your professors. I mean, how did that influence your own time there and the relationships you had with some of the professors? It sounds like in some ways you actually related to some of the professors better, especially maybe at the Rocky Mountain Lab because maybe they could treat you differently than some of the younger students.

COLBORN: I guess, you know, it's really interesting. I think from the time I was a kid, because I was the last—I was eleven years after my brother and sister—my mother and father's friends were always older. There were, you know, principals, people that I always just . . . . [I]

was around adults. I never felt uncomfortable with anybody at any age. I really do feel a little uncomfortable with little kids now. [laughter] I'm not quite sure. They, sort of, look at me, kind of, funny, but I just—I don't know.

The one thing I did feel though, it was very important—well, I couldn't socialize with the kids that I was going to school with. I wasn't into the beer stuff. I wasn't into the weekend parties. So all of that, sort of, was around me, but I dressed like them. I only had jeans and sweatshirts and ski, you know, ski clothes. I always dressed respectably. I had my power suits when I went to the Colorado Areas meetings, you know.

I can remember coming back, and one of the professors was having a reception at his home. I was flying in from Denver, and I had on what I would wear to a meeting in Denver, where you don't look granola. I mean, you look your age and respectable. I walked in, and oh my gosh. You wouldn't believe the change in the attitude of a number of those professors there that I had not worked with very much. I mean, their attitude towards me changed completely. It is very important how you look. But I just felt, I felt maybe I looked like them when I hung around, but I never tried to do the beer parties and things.

I was left out of a lot, which was good, because I really was there to study. To me . . . . I mean, I didn't read a novel, quite frankly, for about fifteen years. Even after I got out, with the work that I was doing and everything, it was only within the last couple of years that I made myself now try to at least have a novel by my bed so I can be reading it because everything was truly nonfiction. It was all very interesting. It was all new. I had so much I had to learn constantly. Yeah, but I never felt out of place. I just knew when it was time to leave, you know.

ROBERTS: So OTA. Was that a similar . . . . I mean, I guess at that point, you're, kind of, going back into a workforce so the age differences aren't going to be as noticeable, perhaps.

COLBORN: Well, not there because, you know, one of the big things at the OTA is they bring in a lot of corporate executives, people that have been around for a long time. People that have been . . . [who] ran the agencies, [who were] heads of this agency, which I began to realize after a while. I still have this going on in Washington, especially with engineering, those kinds of things. We were talking nineteenth century because these were the old gurus who did everything the way we know now was being done wrong. I saw a lot of that kind of advice being given in Washington. Let's bring in the old guys who really were not ready and were not willing to accept any kind of new assumptions, any new science. So I felt pretty bad that we were sending those—especially because with this wonderful opportunity of working at the OTA, they sign us up to work with the AAAS, American Association for Advancement of Science, people that they bring every year and there are about fifty of them. We mingled with them, and they would allow our . . . we were called a "class."

We were allowed to make all our arrangements to do anything we want. It just so happened that there were a few people the year I went in that had aspirations to be opera singers,

ballet dancers, mountain climbers. So we basically got to see the Russian Ballet when they came to the United States for the first time ever. I mean, we were being entertained. We went to the symphony. I had lunch with John Kenneth Galbraith, Cokie Roberts, oh, my favorite, Carl Sagan. Oh man. He was one of the sexiest, most exciting scientists. [laughter]. But we would have lunch, maybe eight or ten of us at the most. We would sit around and have lunches and these are the kinds of things that I was exposed to. We went to the Library of Congress and worked with the people who provide the Congressional Research Service. Those people tell you all kinds of inside stories. You know, how this particular senator does this, and these are the kind of questions he asks, and you won't believe what this one asks for.

I mean, you get pulled into this thing, so you suddenly begin to realize that government is people. You know, we always thought there was somebody out there taking care of us and there isn't. If we're not there doing it ourselves, nobody else is going to do it for us. So these same people, I began to realize, these are people just like me. I got sucked in. I got what they call "Potomac Fever." I felt I had the best of two worlds because I could come home to this—I picked up this little house in 1987 because that was the year the cards were all lined up, and I had been working at the OTA. We told Congress in that year, we came from OTA and EPA [United States Environmental Protection Agency], that we could build a car that can go [one] hundred miles on a gallon. You need to set up café standards. We can build electric cars—it was shoved in the drawer to protect the automobile industry in this country.

At that time I had this gut feeling when I came home, and I knew I was going to have to have a place to live. I wanted it in my small town where I could walk to the grocery store, the post office—the undertaker's right across the street—the doctor, the pharmacy, everything within walking distance because maybe when I got old, maybe I might not be able to see. I shouldn't be driving. Or we're not going to have gas because at that time what I knew at OTA, and what—you know, remember there was a lot of—OTA also has a group that works there, or did work there, under top security on international relations. Enough filters through that basically it was, you know, we're going to have a war. We're going to war over oil if we don't do something about oil. It was oil at that time, in particular for fossil fuel.

So I had this feeling that I needed to get nestled in where I could grow my own fruits and vegetables very much like I had done on the farm. On the farm when we moved there, we had fifteen dollars per person per week for me to raise my family. We made all our own clothing. We grew all our vegetables. You wouldn't believe what we canned and what we froze. We raised most of our own meat and had that butchered. I knew we could do it here. I knew you could survive here.

But that all came together while I was there. Oftentimes I go back now, it's nice. I was back just about a month ago and basically just stayed on the [Capitol] Hill, even ate breakfast in the Senate and House buildings where they . . . . I can get the kind of food that I like. They even have an organic omelet and meet people that I know. It's a very convenient place to know and work with the staffers and people who used to churn through are still there, but they're playing Chinese checkers, moving from one committee to another to another staffer. But it is . . . there's a community there that we need to get our people to infiltrate.

ROBERTS: So what was the project specifically that you were working on at OTA?

COLBORN: Well, my goal was basically to go do a Western water study, but when I got there, just at that time, there was the Bhopal [disaster] . . .

ROBERTS: Right.

COLBORN: And so when I was driving in from the East to the West . . . . I mean, from the West to the East, it was all [about] Bhopal, and Bhopal when I got there. Right about that time, John [D.] Dingell had asked the chemical manufacturers if they would do a report on what kind of safety measures they had. How could we prevent these kind of chemical accidents in the United States? So I was put on that and given the chemical . . . it was the American Chemistry—what did they call it? CMA, Chemical Manufacturers Association at that time. I had that data.

So basically, what I did was sit down and look at what they reported. I was stunned and horrified because basically it said "Oh, we have thousands of indicators." Well, the thousands of indicators turned out to either be thermometers or windsocks. No systems. I mean, it was sad. It was pathetic. It was serious. Then I began attending their meetings, going to their meetings and listening and asking questions. So I did an analysis of that which then we took to the Hill and back to John Dingell's Chief of Staff at that time, [Dave] Finnegan. I remembered his name—Mr. Finnegan. We never did find out what came from that, but that was a stunner. That should have scared the life out of everyone.

ROBERTS: Is that report still around?

COLBORN: Oh, yeah. Oh, sure. It's got to be. Unfortunately, you know, they say we don't need books anymore, but you go from one computer system to another. I have everything on disk. Of course, I didn't take anything away from there. Yeah. But, they're useless. Who's got a machine you can play them on? [laughter]

MCDONNELL: Yeah.

COLBORN: It's really crazy today. Probably—in my boxes that I shipped west over time, as things began to pile up I kept sending them home here for the daughter who lived here, the school teacher, to keep them for me. The stuff is here somewhere, but I think you could

probably get it. Anyway, so that was an OTA report. Then what they did was move me over into the report for Congress in preparation for the reauthorization of the Clean Air Act.

Of course, I was very interested in that because I had been fighting coal. I had been fighting a coal fire power plant right up the valley here, and I was just thrilled because here we are, back with the big databases, plugging in the information from all the coal fire power plants around the country. All you had to do was get on the phone and say we're calling from the Office of Technology Assessment. It was unbelievable. People just drop everything, and they'll send you everything you want.

So [I was] there working with a man by the name of Bob [Robert M.] Friedman. He basically was building this picture—and I'm sure that's all available—of every single coal power plant in the country, how much coal they were burning, where they were getting it from and then going back to the source of the coal so you could calculate the amount of pollution. Of course, what we have here in the valley is very, very clean coal, high BTU [British Thermal Unit], low sulfur coal, very precious coal and this . . .

ROBERTS: We saw a very long train of it leaving here.

COLBORN: Yes. You'll see one every two—I'm surprised, maybe we haven't heard it—but every two hours there's one going up, one coming back empty, about one hundred and ten cars.

ROBERTS: I believe there was a café in Hotchkiss named for the . . .

MCDONNELL: Coal . . .

COLBORN: Because, well, they were remodeling that and building that and then people came in and they bought a little house there. They're rebuilding that. The coal train toppled right there.

MCDONNELL: Oh no.

ROBERTS: Wow.

COLBORN: Everything was shut down for a quite a while. You couldn't get in and out of town. You know, you can picture what it's like. So they call that the "Coal Train."

MCDONNELL: Well, that makes sense now.

COLBORN: Isn't that interesting?

ROBERTS: Amazing.

COLBORN: Yeah. Anyway, so coal was very much involved in that. Then I started doing the ozone work, pulling in the data on ozone which was very interesting because that ozone report then eventually became the unit that EPA used.[4] I mean, they move forward with that in setting compliance where now you know you can regulate with a big stick. In other words, we will set a level at which you will allow your ozone levels to reach, but if you exceed that compliance level, you will lose all federal funding.

That's the way EPA has been able to control ozone in cities. Now ozone is a result of nitrogen oxide and volatile compounds coming up into the air. They all go up into the air and in the presence of sunlight—it takes sunlight—they're converted to ozone. Ozone is a very, very toxic chemical. I mean, one molecule of ozone—you inhale that in, and it gets into the alveoli in your lung. It will burn a hole in that piece of the lung. It's cumulative because the hole can't repair itself. The liver replaces its cells, other organs do, but the lung does not.

It's very serious—what leads to preterm babies, preterm births, low birth weight, asthma in children. [It is] determined before they're born. Again, this is what I call the "endocrine generational effect" that we're so concerned about. Of course, now out here, one of the biggest problems we have is haze. You're going to see this. You're not going to see the country the way we saw the country here fifteen years ago. There's so much natural gas operation and they're burning so much diesel and releasing so much methane and VOCs [volatile organic compounds and] nasty, nasty other gases that come up with the natural gas, that we have haze here that reaches a point where it's exceeding very high levels.

ROBERTS: Wow.

COLBORN: But like I'm thinking at the time, "What a waste of time." I got distracted away from my water, doing all this ozone work. Then three years ago, [I was] working on natural gas, driving out into the fields, suddenly looking around and saying, "Look at all these diesel fumes. My, that's the haze." That's where the . . . haze is smog. It's haze in the forest. It is smog in

[4] T. Colborn, J. Chudnoff, R.M. Friedman, K. Harrison, J.B. Milford, R.D. Rapoport, N.B. Szabo (eds), "Catching our Breath: Next Steps for Reducing Urban Ozone," Congress of the United States, Office of Technology Assessment, 238 pp, 1989.

cities. It all came together, and we're working very hard to use that as an issue to basically make them start doing everything right.

ROBERTS: So applying ground level ozone standards that are used in urban areas out in places like this.

COLBORN: We need them here.

ROBERTS: Okay.

COLBORN: So and now this is what we have to do. We have to be able to apply those, or we're going to lose our forest. You kill trees. You lost the San Bernardino Valley [California] forest trees because of ozone. They know it. It's very serious. We have a bigger problem than just water pollution, with natural gas now. So it's like for me, it's all one big thing coming back together. Isn't it amazing?

ROBERTS: It is.

COLBORN: It is amazing. Maybe if you live long enough, I guess this kind of thing can happen.

ROBERTS: That's true.

MCDONNELL: Is that the first time you were introduced to that while you were at the OTA? Thinking about . . .

COLBORN: Ozone, oh, yeah, thinking about air pollution. I had not thought about air pollution, no. [. . .]

I had not thought about it out here, with this issue, until I got involved. I got out and I got into the fields and getting out, also being a birder, I spent a lot of time outside. All these film companies are coming in from around the world to film here about endocrine disruption. They were coming out, and they couldn't get the pictures. We had lost the beautiful—what we call vistas, panoramas that you could photograph. You lose these single rocks that stick up in the foreground in a picture. They're gone. You just don't see them. That's what I began to realize, hey, there's something else going on here.

Then I got a call to come out to Jackson Hole, Wyoming, because they had hit one hundred and fifty five parts-per-billion in ozone out there in the winter. Because of the snow, they had additional—more like sunlight—they had the Albedo Effect with the sunlight returning, going back up. They had to shut down the ski areas and close the schools. You couldn't let the kids go out. They let those men work outside, all those men working in that, and now then they began to recognize that it's pretty common wherever you take an ozone monitor and look for it, but no one's taking an ozone monitor yet. The states don't have the money to buy them. The government has taken its hands off. You know, the [United States] Congress and also [George W.] Bush and [Richard B.] Cheney removed the Clean Air Act, Clean Water Act, the Safe Drinking Water Act, CERCLA [Comprehensive Environmental Response, Compensation, and Liability Act] and NEPA [National Environmental Policy Act]. Basically they just pulled them up completely away from any interference with natural gas. It's the only industry that's not regulated now under all those laws. There's no inspection, very little inspection, and no oversight. If you get out here and do it fast and quick and clean, and basically, too fast, too quick, and the cheapest way . . . that's what we've got now to the west of us.

ROBERTS: What are the chances that something like that is going to be redressed?

COLBORN: It's going to take an act of Congress. To reenact those bills. It will. Diana DeGette is going just for the Safe Drinking Water Act. That isn't enough. That's just the beginning, but anyway, that's a whole other story. We need full disclosure, and until we know what they're using. So see how everything just seemed to weave together.

MCDONNELL: Yeah.

COLBORN: It's amazing.

MCDONNELL: After your time at OTA, where did your career go then?

COLBORN: Well, it was really funny. At the end of the second year, I thought I'd come home and try to work at the Colorado Department of Health. People said, "Oh my God. Don't come back here. They made our Colorado Department of Health . . ." [. . .] They put it on a cash basis. In other words, the only money they get to regulate is based on the permits they can sell. They have to get towns to pay a permit to run a sewage treatment plant. You have to buy a permit to run a water treatment plant. You have to buy a permit maybe to set up a septic tank, that kind of thing. That's the only way they can regulate it.

So they said, “Don’t come back.” That was because we had powerful industries on the eastern slope who were polluting like Coors [Brewing Company] and Gates [Corporation]. I’ll name some of them, you know, that were . . . and they had a lot of control in this state, and basically [they] went in and put our poor Department of Health in that position. So they said, “Don’t come back.” But it was funny. So I was trying to decide what am I going to do, you know? Where am I going to go? I figured I would come home here and maybe just write a book. I don’t know, but anyway, so to try to do more science, I’d come back and be a pharmacist. I really did.

I thought I would have to do that when I got a call from a man who said, “I have your resume. Would you mind coming over and talking to me?” I said yes, and I went over to see him. His name is Rich [Richard A.] Liroff. He’s a political scientist. He was working at a place called Conservation Foundation, which was a very right-wing, conservative non-profit in Washington, DC, run by Russell [E.] Train. I had no idea. I still didn’t know what the difference was between a conservative or progressive or, you know, a right-winger or a left-winger. All I always felt was that health issues should not be partisan issues. They should be bipartisan issues, and I didn’t care who I talked to. I was really, sort of, slowly moving into this and at that time, the conservatives were really in power in Washington.

So I came over and I looked at the thing and he tossed this one-pager in front of me. He said, “One of our members here at the Conservation Foundation, Terry [J. Clarence] Davies sits on the International Joint Commissions Board between Canada and the United States.” This was a commission that was established in 1909 to protect the boundary waters. Then in 1972 when the lakes got so dirty, they set up what they called *The Great Lakes Water Quality Agreement*.[5] They were going to clean up the lakes, you know, by 1985. They were going to be all cleaned up and no more toxic chemicals in the lakes.

He said, “We’ve got the money to move forward to do an assessment on the state of the health of the Great Lakes. They want it in a report.” So here was this little thing that said they wanted to do it. All I could think about as I read it was . . . . I said, “Oh my gosh, there’s a story there.” Because when I was teaching limnology at the University of Wisconsin, I taught it out of the limnology building, limnology department, and the professors there were the ones who were deciding what fish we stock in the lake each year because the fisheries crashed in the 1930s, early 1940s. By 1950, no one could make much money in the commercial fishing industry.

Since then, we’d been spending well over fifty million dollars a year between Canada and the United States stocking fish, putting them in the lakes, telling people not to eat them, of course, but it kept the recreation business going. It kept recreation alive and kept a lot of families eating. Consequently . . . and all the limnology courses that they taught—and I sat in on all their lectures—they never took into consideration that toxic chemicals could be the reason that there were no fish in the lake. They blamed it on overfishing, that the fisheries had just did

[5] International Joint Commission of the United States and Canada, *The Great Lakes Water Quality Agreement* (Ottawa, Canada: 1972, renewed in 1978).

it to themselves. They blamed it on the lamprey eel. They blamed it on diversions of water, but never, never chemicals.

I looked at this thing and said, "Oh boy. There's a story there." I just had a gut feeling. As it turned out, I took a terrible cut in pay, but he said he would hire me because I wanted to do it. I've learned to live on practically nothing. You can give me nineteen, twenty thousand dollars a year, and I can live, and I can live anywhere. Of course, I figured, "Oh well. I'll just stay on in Washington and do this because it was so fascinating." Again, why did this happen? So I did that. Of course, that was immediately . . . they set me up so that I could meet with all the wildlife biologists around the Great Lakes, from Canada and the United States. Rich and I had to fly to Hamilton, to the Centers for [inaudible] Water where we met with Division of Wildlife people from the United States, you know, fisheries people, and that sort of thing. We sat around a big table.

It was my job flying in—I only had about two days to think about any of this—how I was going to collect the data, do what I had in mind, and present it in the terms of an ecosystem approach. This was the new word at that time. Let's get away from the problem of the chemicals . . . and I always said you get the corporate people on all these boards [saying], "Well, we can't look at the chemicals. Let's take an ecosystem approach. Let's look at everything." You know, water levels . . . . So anyway, I thought, "Huh. I really am interested in this." So going up on the plane I figured out what I would do and how I would present the data because what I wanted them to do was make sure that I got every report they ever wrote on anything to do with chemicals in the water and chemicals in fish in the Great Lakes and birds around the Lakes. It was interesting. You wouldn't believe the data I began to collect, but I pulled it together and the first product that I produced was called *The Great Lakes Toxics Working Paper*.[6] I have a copy you people can take home with you, if you want. There's so many of them. We printed them up. They're still around.

Basically, what I did was collect all the data [. . .] and of course as I was working on this for the book, and these things were coming in, and I had a box, you know, these boxes that you used to put magazines in. I had one for each bird species, and I also had some for chemicals. They were all around the floor around me. As I'd get a paper, I'd put it into that box. I came up with just a simple, simple—what you would say almost a sophomore in high school could do—a list of sixteen top predator species in the lakes, down across the Y-axis and across the bottom or the top. I listed the health effects—broke them out into categories—that they found in the animals. These were all species that we had evidence that they had declined, in some places the populations had disappeared. There was some information on them.

Basically, what turned out was the fact that the animals were not dying from cancer. These populations were not being wiped out by cancer and that the populations were being wiped out because [there] was something wrong with their reproductive tracts. The male and female gonads were different. The thyroids were different. Their behavior was different. The

[6] Theo Colborn, *The Great Lakes Toxics Working Paper* (Canada: Environmental Interpretation Division, Environment Canada, 1988).

males weren't acting like males. The females weren't doing what they were doing. In other words, all of this stuff that's connected with reproductivity. It was very obvious that it was happening most severely in the animals who had the highest concentrations of the chemicals in their bodies.

So this all came together. When you start looking at this and then you think about how we have tested chemicals and everything in risk assessment is based on cancer, there is definitely something wrong here. The one thing also that we missed was that the mother is the transport medium. The mother is basically who you dose. The mother is the delivery system to the baby, this transgenerational effect. That had never been taken into consideration. Risk assessment was out. This was bad. Cancer wasn't the answer. It was this transgenerational problem in the animals and they could not reproduce, and it was because it was being passed on.

Then of course, the only human evidence I had was the work of the Jacobsons [Sandra W. Jacobson & Joseph L. Jacobson], who had done all of the work on children of mothers who ate fish out of the Great Lakes.[7] They began running into these ADHD [Attention Deficit Hyperactivity Disorder]-like problems, intelligence, and behavior. Again, based on the concentrations in the mothers. That was enough then to get me going. But Rich was about ready to give up. He said, "Well, I just don't think we have enough here. You haven't given me enough." He was running out of money. He was spending money on having too many meetings, so he was going to let me go, and he wanted me to give him everything that I had. I did, and I gave him that [species list].

When he saw that thing, he said, "Oh my God. We've got it, but we're still going to have to quit." I immediately let the Canadians know that he was going to shut down and then Environment Canada came through. They flew down in about a week. They came with this man who had this wonderful idea that we were going to write a book. They were going to supply all the rest of the money that we needed to the end. Then I got additional contracts from Environment Canada, and then I began getting contracts from Health Canada and that's what I lived on. I wasn't getting any money from World Wildlife Fund. Basically, I was . . . . I had to generate some grant money so I could pay them to be there. So I was generating grant money for my space, but I was getting contracts that were coming in. So I was there as a senior fellow using that office in that building as my office.

ROBERTS: Two clarifications, one, do you know—do you remember the name of the person who came down from Health or from Environment Canada, who when the project was going to shut down . . . ?

[7] S. L. Jacobson, S. W. Jacobson, and H. E. B. Humphrey, "Effects of exposure to PCBs and related compounds on growth and activity in children," *Neurotoxicolicology and Teratology* **12** (1990): 319-326; B. T. Kagey and A. D. Stark, "Indicators of human reproductive health within the Great Lakes drainage basin ecosystem" (paper presented at the Facilitating Access to Great Lakes Basin-Wide Health Data Conference, Minneapolis, Minnesota, June 25, 1992).

COLBORN: Oh, well, Darrell Piekarz. Oh yeah. There were a couple of them. Let me see. I'm trying to think—Darrell, oh, and [R.A.] Tony Hodge. I'll give you the—I can give you one of these copies. But it was that simple, it was that thing, that simple table, that . . . again, this was what got through to the political scientists, who then would take it and translate it into policy. That's where I learned that, God, you've got to have it—keep it simple. You really have to keep it simple.

MCDONNELL: So is this around the time that you met Pete [John Peterson] Myers or where did you . . . ?

COLBORN: No. I hadn't met Pete, yet.

ROBERTS: Yeah. So I think even backing up from there, at what point did you stop being associated with the Conservation Foundation?

COLBORN: Well, the Conservation . . . . Oh, what happened was shortly after there I was only about—oooh, how long was I there? Just a few months, and they were absorbed in World Wildlife Fund. Russell Train wanted to retire . . .

ROBERTS: So the Conservation Foundation came . . .

COLBORN: Got Bill—remember Bill [William K.] Reilly was running the Conservation Foundation. That was his home. So Bill moved right into . . . and of course, Bill came to us and said, "Oh boy. What this is going to do for the Conservation Foundation. Oh, man. Oh, man." Of course, it just got gobbled up. So that's how I ended up there.

ROBERTS: How were they reacting to the type of work that you were doing?

COLBORN: They kept me behind the scenes. They really did. [. . .] Isn't this crazy?

ROBERTS: It is.

COLBORN: It really is. [. . .]

ROBERTS: All right. All right so you were . . .

COLBORN: You know, you're helping me because I have to keep expressing this more because I've got to be able to get this out to the public eventually.

MCDONNELL: Yeah.

ROBERTS: That's right. That's right. Okay, so you're at of World Wildlife Fund . . .

COLBORN: So I'm at World Wildlife . . .

ROBERTS: So it's *now* World Wildlife . . .

COLBORN: So I'm making money, doing real well. Oh boy, you know. As Dianne [Dumanoski] said . . . sitting there, I was living right on Capitol Hill looking out over the dome. You know, and why me? You know, why me? But well, I'll just keep doing it, working on contracts and that's when Pete came along. I heard him, he came to speak at an Audubon meeting in Fairfax, [Virginia]. Of course, the minute I got to Washington, [DC], I found a birding group. So I was birding, you know, every weekend, Chesapeake Bay, everywhere. I got to meet a lot of really interesting people. We were doing the town. That's when I took weekends off. I don't even do that anymore.

Anyway, so I heard him talk and I tried to get up to talk to him because he talked about the migrating sandpipers. That was his big thing, you know how Pete is. All the important people were crowding around him. [. . .] I just kept thinking about him more and more. I thought, you know, I think I'll call him. So I called him from my office in Washington and told him that I'd heard his talk. I got through to him, amazingly, and [said] that I really wanted to talk to him because I'd been doing all this stuff with chemicals and transgenerational effect and the work around the Great Lakes. He had not heard it. I began filling him in on it. He said to me, "Well, wait a minute. Wait a minute. Wait a minute. You catch a plane"—you know how Pete is—"Catch a plane. Come up here." Well, this was . . . let me see, I flew in on December 17, so it must have been about the thirteenth [of December]. He said, "Fly up here." He said, "And I want to talk to you." He said, "You need to be working with me."

ROBERTS: At this point, is he at Audubon [National Audubon Society] or at Jones [W. Alton Jones Foundation]?

COLBORN: He was at Audubon. He was still there. All I kept thinking was "Oh good. I'm going to get out of here. Oh good. I'm going to get out of here. I can go work at Audubon, but I refuse to . . . he's going to have to let me live. . ." Because he was talking about me working there, "You know, you got to get up here." I made all these things about what I could bring to Audubon. I was really set, and I had this wonderful thing that what we could, you know, what I could do from Washington, DC, because I loved it right there on the Hill in the middle of the action. I was getting known. I was . . . because I'd already met these people in the Congressional Services and they were sending me stuff all the time. So it was great going in as AAAS, along with the OTA group.

Anyway, I caught the plane, but my sister lives in New Jersey, so I took the train up and then I was going to take the train back to Point Pleasant, New Jersey, Matasquan, and go down and spend Christmas with them. Wait a minute. No. It was December 17 when he called me because [. . .] it was just about Christmas Eve. It was bitter cold. Oh my God, was it cold. So I get to his office, and they're having a big Christmas party. He said, "Forget that. Forget that." He takes me up to his—you should have seen the place he had, a big room. There was no place to sit but a huge couch. "Sit," he said. "Everything's changed." He said, "Have you ever heard of the W. Alton Jones Foundation?" I said no. "Well," he said. "Look at this. Look it. Look at this opportunity I've got."

It was like I'd known him for a long time, you know. Here's this man out of the blue. [He said], "Well, you know, I'm going to have forty million dollars to give away every year." I looked at him and I said, "You're going to take it, of course, aren't you?" You know, I'm sitting there saying, "Oh my God." He said, "Well, yeah." He said, "But I told them I come with a package." I said, "Well, what's the package?" He said, "The package is you." I looked at him and said, what? He said yeah. He said, "It's not done yet, but I think we're almost there." He said, "Don't even worry about coming here." I never had a chance to even begin to talk to him. So that was it.

The next thing I know, yeah, I didn't have to worry where I was going. I mean, what I was going to do when this project ended with Rich Liroff, who eventually by the way, I hired back. Then that was when I said yeah. So I went to the man who I worked under at World Wildlife Fund, who was dumb as could be, but he was a politician. He had been the head of the Department of Environment for Delaware for years, a disgrace, you know, just a disgrace. I would hear him through the wall, and it was nothing but old crony stuff, nothing substantial. It was so bad, doing everything on a boat because they all had boats.

So anyway, as it turned out I heard from Pete. He said, "Well, I'm going to make you—give you a chair at the W. Alton Jones Foundation." He said, "And you're going to have to come work in Charlottesville, [Virginia], at least three days a week," which was rough. Oh God, it was rough, and it was such a waste of time, and there was no reason to be there because he wanted to work with me. Well, we never got a chance to work with each other. At that time, my goal was to write a book. The book was going to be about what we had discovered with the birds. No, it wasn't. Wait a minute. It wasn't yet. I'm sorry. The book comes later. My goal was basically . . . oh, I know what he said, "You just focus on endocrine disruption. Just start

focusing on it." He put me in a beautiful office with a huge table, and I began collecting papers, all the documents I could get on anything and beginning to enter data again into a big spreadsheet, what I call my "monster." He would walk in every now and then and say, Well, what have you got?" It just didn't work. It just didn't work at all. Wait a minute now. I've got this out of sequence. Wait a minute. Wait a minute.

Yeah, because I was a senior fellow with them; I was with them from 1990 to 1993. That's right. Okay. I kept saying, well, and I would pull in people's work, and he'd say, "Well, why are you working with that person? That one's no good." But then he'd leave, and we never had a chance really to work with each other. But that terrible drive, and trying to maintain two apartments; I had to maintain another apartment there. So that went on, and I just kept compiling more stuff.

Then one day when I was working in Washington, DC, I got a call from someone upstairs in World Wildlife Fund who said this man was in from the Johnson Foundation . . . oh, by the way, I know what happened. The book did come out, our book—the book *Great Lakes: Great Legacy?* came out.[8] That's what it was. It was the following of that, and then there was this idea, now we'll write another book. I would write another book, but I would do it on my own, and that's when he walked in from the Johnson Foundation, and he said to me, "Tell me about your work." He said, "People upstairs said you're really doing something really and it has real policy implications." He said, "You know, the Johnson Foundation, we have this nice place in Racine, Wisconsin, you know." He said, "Tell me about it." So I told him. He said, "Well, what do you want to do?"

I looked at him and said, "Well, I've really reached the point where I've collected enough information from so many different sources and so many disciplines that I really feel I need to bring . . . because at this point, I can't go ahead and do this alone, this endocrine disruption thing that I've discovered and this transgenerational stuff. Quite frankly, if I could bring a whole bunch of experts together and have them tell me whether they agree what I'm thinking about or if I'm half-cocked, if I'm crazy, I want to know because I can walk away from this without wasting a lot of energy and time."

He looked at me and he said, "Well, what is it you want to do?" I said, "Well, I want to bring them someplace, but I have to have them where they can't leave. They're going to have to sit and talk with each other. I've got an idea in mind about how I want to do it." He said, "I've got just the place for you." That's when he said to me, "You have a place to go ahead and have a meeting." Then later on, I began thinking about the meeting, and I got in my proposal to him. He said, "Well, we can do it in such amount of time. You know, it's going to take some time." I said yes. It took a year-and-a-half basically to really think about it and pull it together. During that time then, I began visiting some of these people whose papers I had read.

[8] T. Colborn, A. Davidson, S. N. Green, R. A. Hodge, C. L. Jackson, R. A. Liroff,eds, *Great Lakes: Great Legacy?* (Washington D.C.: The Conservation Foundation and The Institute for Research on Public Policy, 1990).

I also began working with a woman at World Wildlife Fund who did dispute resolution type of stuff. I said, "How can I bring people together? I've got an idea on how I want to structure a meeting." Apparently it had never been used before, and she thought it was great. But basically, you never . . . and I had just a wonderful report, and I'm trying to think of the foundation that did it. I was trying to think of it for you earlier, but they said never bring more than twenty to twenty-five people together in a room or you'll never resolve anything. Also be very careful who you invite because all it takes is one person in the room to ruin any progress. You can't make any progress.

With my gut feeling about how I can phone people and talk to them, how I relate to people when I meet them, I figured okay. I talked to her about it. I said, "Suzanne, what if I get people there that I feel I vibe with?" She said, "Go for it." Okay. So we get no more than twenty-five, only had twenty-one. Then you break them into just groups, and they all come and they each have a chance to talk about what they do, come and tell you what they do, relate it to the topic of the meeting, which was going to be endocrine disruption, the wildlife/human connection. [. . .] Well, anyway. I was thinking back, oh yeah. How did I go through this? Then so I said, "Then Suzanne, after they all had a chance to hear each other and then you break up into groups of four and five and no more, they each go off, but they all go off with the same set of questions. They had three questions: one, is this a problem? If it's not, you can quit now. Two, if it is a problem, then describe it. And three, how serious is it? In other words, what would you do next?" There were about three steps in there, and that's all they had to do. She thought it would work.

Then out of the blue, I got . . . and I was driving back to Colorado for the summer to work out here. I was still with Pete, but I was coming out for my summer vacation. I got a paper from John [J.] Vandenberg, a wonderful behavioral biologist at the University of—wait a minute, North Carolina State University. He said, "I've read about your work. I read your book. I think you need to read this paper." It was Fred [Frederick] vom Saal's paper on the intrauterine position.[9] Just about a month before that—okay, I'm still living on Canadian money. I was working for Health Canada. [. . .] They, at that time—they used all their library services. Their library services were doing fantastic searches for me, and I would ride on airplanes . . . remember how you get your searches, and they fold out and you'd have a stack like that? I would go through and mark off every paper I wanted, reading on planes, and that's how I got through these long trips. Then I'd mail that back to them. They would then begin to mail me back the papers.

That's why the papers were coming in. I asked Jonathan, "Why are the papers coming in?" So I got the people stuff too. I had human health. I was getting into the human health really seriously, and laboratory work, anything. Just about a month before I got this thing from John Vandenberg, I'd been in Canada with the Canadians and they had brought in everyone . . . and there were only about fifteen people in the world who had been working on dioxin. They wanted

[9] F.S. vom Saal, "The production of and sensitivity to cues that delay puberty and prolong subsequent oestrous cycles in female mice are influenced by prior intrauterine position," *Journal of Reproduction and Fertility* **86** (1989):457-471.

to come to some conclusion about what were they going to do about dioxin. Was it bad? Could we do anything with it?

At that meeting, Dick [Richard E.] Peterson from the University of Wisconsin got up and talked about a study that he had done where he looked at not only the behavior of the animals that [were] exposed to low doses of dioxin . . . the first low dose dioxin study ever done at the request of the NIEHS [National Institute of Environmental Health Sciences].[10] [He is] a wonderful person down there that I'm still working with. He just said, "Why don't you look at some low-dose stuff? You know, what are people exposed to. Forget the laboratory." So Dick came up with a whole series of behavioral changes in the animals. He went through morphological changes in the animals, biochemical changes in the animals. It was really very interesting. They were all broken down into categories. Male, female response.

Then I get this letter from John Vandenberg and Fred vom Saal. It was as if Fred vom Saal had seen Peterson's paper and here's vom Saal's study looking at the animal's intrauterine position and describing it the same way Peterson described it.[11] You know, sexual preference, aggression. The whole thing, it was all there. I went, "Oh my God." So I was just leaving then to come west. I called Fred vom Saal, and I said to Fred, "I've got to see you. I'm coming through Missouri. I'll be there." I began telling him what Dick found . . . actually, my sister and I were already in a motel room in Boulder because I stopped over there to do a lecture on the way. I mean, if I'm traveling across the country, I'll pick up colleges. I'd lectured in Boulder and we were there in Boulder when I called him. My sister can always remember sitting on the bed—this conversation went on for three hours, because—have you met Fred vom Saal yet?

ROBERTS: [Yes].

COLBORN: You know Fred. He's a genius. He really is. I began talking to him, and it went on and on. I was laying on the bed, [saying], "Oh my God. Oh my God." You know, and she kept handing me papers. It was unbelievable. Then he said, "But I'm sorry. I just accepted a sabbatical. I'm going to Columbia University for the summer. I won't be here."

MCDONNELL: Oh no.

COLBORN: But he said, "We can get together at the end of the summer." Anyway, so in the meantime, I came home, did my thing here. Then in the fall, I went to see Fred. It was then when I sat down with Fred and I said, "Okay, while I'm here there's a behavior guy that I really

[10] C.K. Kelling, L.A. Menahan, and R.E. Peterson, "Effects of 2,3,7,8-tetrachlorodibenzo-p-dioxin treatment on mechanical function of the rat heart," *Toxicol. Appl. Pharmacol*. **91** (1987): 497-501.

[11] F. vom Saal, "Intrauterine positioning of male and female fetuses influences prenatal hormone titers and adult behavior," Fifth World Congress of Sexology, Exerpta Medica, Amsterdam 1982.

want to look into." The man who had been looking into homosexuality, and I could dig that name up. We don't want it. He was a total loss. But I wanted to see him. I had to see him because he was key because the big thing that worried me was homosexuality. If that became the issue, we could lose the whole thing. Yet I know it's possible and I know it's real. I mean, I know this is one of the problems we're living with today, but it isn't anything that to me should be surfacing. If it ever surfaced, it would have killed it from the very beginning. But so I had to see this guy and see how he would handle it. It was really crazy.

So I met Fred at Columbia. We were sitting downstairs having lunch. I said "Now, I have to go up." Of course, we were already on. Who am I going to bring to this meeting? I had this place to have this meeting. I had Fred and he was—we were sitting there writing down names. He gets me on the elevator, I go up on the elevator, and this very strange man gets on the elevator carrying a bag. He gets off on the same floor that I had to get off on. I looked at him, I said, "Oh God. I'll bet that's him." Weird. Oh my God. [laughter]. So anyway, I go down the hall. He makes me wait, and then I go in. He eats his lunch, and he was supposed to meet me at that particular time. I go in and the minute we started talking, I said, "This is a disaster. I don't want this one. Not at all." So that was how I was writing people off my list.

Then I kept working with Fred. So Fred was extremely, extremely helpful. Then, of course, I began talking to Pete about putting the meeting together and getting it together, and he said great. Then I asked Pete if he would moderate. Near the end—we got to the end, and I kept thinking, "Okay. Pete's got to be there somehow, someway," although he was going to be in Europe for a big climate change meeting. I said to him, "Well, can't you get back in time to moderate?" He said yeah. He came late, and he left early. So I had to conduct the front end, and had to conduct the rear end, but he did come in with this wonderful idea which I think was so important. We are certain of—how does it start out? [It started with] "We know with certainty that we are . . ." Anyway, the whole thing, the way the thing was written. That got us on how we began to work to structure it at the end. So it was really very interesting. He conducts an excellent meeting; he really does. I mean, he kept everybody in line. We were on time. We made it. But they—the first night—after that first night, none of those people went to bed. Well, I should say some of them did, but it was quite a meeting. Anyway, back to before that. Basically, that's how it worked. I kept adding people very slowly. John [A.] McLachlan actually refused, absolutely would not, would not come. But when he found out that Howard [A.] Bern was coming, the last week he called and asked if he could come.

ROBERTS: Why was he . . .

COLBORN: He didn't want any part of this. He just thought it was, you know, this is John. I went to meet John and talked with him about all of this. He just cut me off completely and he said, "No, I won't come. No, just too busy." Got to go see . . . there was going to be a Gordon [Research] Conference the next week. Well, Howard Bern, when I talked to Howard the first time and said, "Howard, will you come?" He said, "Theo, I'm getting old. This is very interesting, very nice, my dear, but I can't make it." Then he called me back a day later and he

said, "I'd be crazy now that I see what you want to do." He said, "And I have a daughter that lives right there. I can come visit my daughter." Then he said, "I will go on to the Gordon Conference." It was real funny. Then of course, we all had to send to each other a copy of something that we had published in advance, everyone was supposed to read each other's, which I figured they wouldn't read until they were coming in on the plane.

But, Howard Bern was in Racine ahead of—we got there—so we were there early in the morning. Howard was there when we got there at the hotel. He came dashing in, and he said right away, "Where's Theo Colborn? I want to meet you." He came over and he shook my hand, and he hugged me. He said, "I can't believe it. This paper lays it all out, and it's all there." It's the thing that I wrote for Food Safety.[12] You know, basically, you take it through, you see it in the cell. You see it in the tissue. You see it in the animal. So I felt so good because I'll tell you quite frankly, I thought I was going to come away from this meeting with everybody saying forget it. I just wasn't sure. I knew I had Fred, but you know Fred. Ana [M.] Soto was very, very interested. So [there were] those who really, from the very beginning, hung in there . . . it is going to be very interesting to see when you go to [meet] [L.] Earl Gray, because, you know, he's hung in there, but he's not given up toxicology at all. He can't. He just has not—cannot work under the assumptions of the inverted U, timing and that sort of thing.

Anyway, so the whole thing was very interesting, but it was during that time going back and forth and back and forth, I finally just stopped going down to Charlottesville. It was just too much. Physically it was very, very wearing trying to have food when I prepare all my own food anyway and that kind of stuff. It worked out real well. But, then after the Wingspread Statement came out, immediately—and I was still going down there—[The] Pew [Charitable Trusts] got a hold of me and said they wanted to give me Pew's— they wanted to give me a Pew Fellows [Scholars Award in Environment and Conservation] so that I could write a book.[13] In other words, they'd give me fifty thousand [dollars] a year for three years, that way you get it, and then I could write a book because the technical book . . . okay, I got the technical book out, which to this day does not . . . . I can't believe the young woman that I got again to be the editor of that book for me, a young ballet dancer with a good science background who needed a job in Washington so she could be there with the ballet.

ROBERTS: This is the *Great Lakes: Great Legacy?*

COLBORN: No. This is the technical book, the gray book, remember?[14] They decided they wanted to do a consensus statement and they wanted to do the gray—and they wanted to do a book . . .

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[12] T. Colborn, "Nontraditional evaluation of risk from fish contaminants," Symposium on Issues in Seafood Safety, Ahmed F (ed), Institute of Medicine, National Academy of Sciences (1991): 95-122.

[13] T. Colborn, et al., "Wildlife/Human Connection," *Environmental Health Perspectives Supplements*, 104:S4 (August 1996).

[14] C. Clement and T. Colborn, eds, "Chemically-Induced Alterations in Sexual and Functional Development: The wildlife/human connection," in *Advances in Modern Toxicology* Volume XXI (Princeton: Princeton Scientific

ROBERTS: I got you.

COLBORN: Each one of them was supposed to submit a paper to the book. John McLachlan held us up again. He wanted to do the be-all-and-end-all paper. He couldn't get it done. I finally said to John, "We are missing—we could have had this book published. We could have been out six months, John, and we lost it." Then by that time, when I sent the book to Elsevier to be published, Elsevier wrote back and said they were very sorry, but they could no longer afford to publish expensive books like this, that they were going out of expensive book business and they could not publish it.

Of course, they are still selling expensive books. I had to immediately find someone else, and that's when I called John Cairns [Jr.], a well-known aquatic biologist and said, "John, you won't believe what happened." He said, "Oh, just call Myron Melvin. I'll get Myron to do it." So I called Myron Melvin, who is a guy who has a beef with the energy companies anyway, it turns out now, interesting. He said he would publish it in his series. So we got it published in that Princeton Scientific Publishing Series. Then I had to go find the chlorine-free paper and deliver it to him. He was really unbelievable.

But after that book came out, then the foundations weren't happy. They would be willing to give me money if we could get this translated into a popular press book. That's when I said to Pete, "Will you help me write the book?" He said, "Yeah, yeah, we'll do it together." I gave him the eight copies, the eight chapters that I had written that I had given to an agent to take around to see if a publisher would publish it. There were a lot more publishers then. He had three who said, "Yes, this is a very important book, but she'd put anybody to sleep. She writes too technically." Anyway, he said, "She needs a ghost. Get her a ghost." So I went back to Pete and I said, "Well, you don't have to be a ghost; just do it with me." He said okay. For another six months, we never saw each other. He was too busy; he never had a minute to spend with me. That's when we were both at an environmental writers meeting in Duke University, North Carolina, where I was sitting in the audience. Pete was in the audience, and Dianne Dumanoski was up talking.

Now, right after the technical book came out, I started hitting Harvard [University], MIT [Massachusetts Institute of Technology]. What are some of the other campuses up around in there? Oh, Tufts [University]. Hitting all the campuses in that area and doing lectures, trying to do grand rounds every now and then. I would go to Boston, [Massachusetts], to talk, and Dianne was with me every time. *The Boston Globe* wouldn't let her write about it. She felt that this was going to be the story of the century, and it needed to be written. I said, "Well, you know Dianne's just finishing up a sabbatical out at Colorado University, at the night school there. She needs something to do. She doesn't want to go back to the *Globe* because they won't let her do

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Publishing, Inc., 1992).

what she wants to do." He said, "Well, go for it." He went off with Tim [Timothy E.] Wirth and Tom [Thomas E.] Lovejoy.[15] He said, "Go get her."

So I went off after Dianne, and I grabbed her. And after dinner I sat her down—and I can remember where we sat in the most beautiful sitting room down in Duke, and only the two of us there, everybody was scattered—and on a big couch, and I said to her, "You know, I've got to write this book. We have to get this book done. It's a technical book, too technical now." She looked at me, and she began to cry.

She said, "You know, ten years ago—almost ten years ago to the day—I had to be flown home from Europe because I had a terrible brain tumor, and they didn't dare operate on me over there." I just collapsed, found out she had it. She came home to have this brain tumor removed, and they told her she probably might not be able to talk or walk, she might be handicapped afterward. She came through it with just a very slight limp, a drag in her left leg. She said, "I always thought I was left on earth to do something important, and I want to do this." That's when she pitched in.

ROBERTS: Wow.

COLBORN: Then we pulled in Dianne; she started writing, I kept feeding her stuff. I would have to spend weekends and days with her because Dianne has to get into the story and oh, we traveled around. You wouldn't believe the blizzards we drove through to get over to see some of the guys at the Great Lakes. It was the same thing all over again. Basically, that's how it came about, and then we would meet about every three or four months with Pete or maybe even longer in between and just go over what we were doing, how are we going to move next, whatever direction are we going to go in. That's basically how it worked out. Then of course, she got cancer near the end and it was held up for a year. Finally, we got that out.

But back to the Wingspread meeting, it was quite a meeting. The wildlife biologists—I had them start first, so they would tell their stories. It was really very interesting because they would show, you know, they'd get up and show the gonads of the birds and fish. I can remember McLachlan and Bern, and Fred vom Saal, some of the others there who would [say] "Oh my God. That could be a human slide." They're yelling, "They all look alike." You know, and this thing's beginning to happen. It just began to boil. It was unbelievable. It turned into quite an event, and that night so many of them stayed up—they didn't—they drank all the booze they were supposed to have for the whole weekend. There was nothing left for the next night. [laughter] Then they broke off into their little groups and of course, John McLachlan immediately took off on some bicycles [that] were there [and] took his group way out along the shoreline of the lake to do their work.

[15] Thomas E. Lovejoy III, interview by David J. Caruso and Kenneth M. Evans via Zoom, 7 and 30 July 2021 (Houston and Philadelphia: Rice University's Baker Institute for Public Policy and the Science History Institute, Oral History Transcript # 1120).

Of course, it was my job to, sort of, walk around and find out how they were doing. I went to the other groups. I gave them half an hour, and then I thought I would walk in and just make sure they had everything they needed. I did not sit in on any group. I didn't want to push anything in any way. I just kept my mouth shut. First group I went into they were already into not only the second, but the third answer. They were working. That's the way it turned out. They went back to their groups, and they just all . . . but I will have to admit that as I watched them present their information and interact and work with each other, that's when I decided again, using the report that I have on how you get things done, I'd picked those people that were leaders.

I also made sure there was no friend; there were very few friends there, so there was no wildlife biologist in with the wildlife biologists. John McLachlan was not in with Howard Bern because they knew each other. There was Ana [Soto] in with Howard Bern. So I kept them all separated so that they were all working, in essence, with strangers. It was remarkable. Then the next morning, of course, we would all come back then and begin to look—each group had had their Sunday morning—they would have their chance to say this is what we think we should do, and it was unbelievable how it would just overlap. Then as we took that, then we had to come up with, okay, how do we write the consensus statement. That meeting was on July 28 around that time.

Then the International Joint Commission was having a real big meeting, a bi-annual meeting up on Lake Superior where lots and lots of people were coming because they're very concerned about the contaminants in the lake. You had to get a small plane to get into the meeting. I knew that Bill Reilly was coming, and I figured he'd have to be on that small plane. [I thought], "I'm going to take a plane and he's going to be the first to leave. I'm going to get on the first plane to get out of there."

[. . .] So then what happened was I'd been working with Cora Lee, sending this thing out to everybody. Everybody had to agree. We agreed that every "T" had to be crossed . . . if it had to be "could" or could it be a "might" or could it be a "may"—these very delicate words that can change the tone. We finally resolved it so that we got the last period resolved while I was at that meeting. Cora Lee was smart enough to fax it up to the hotel, and I had this faxed consensus statement so that when I walked out and went to the airport and I was standing in line to get on the airplane, Bill Reilly comes up and says, "Oh, Theo. How are you? What are you doing these days?' I said, "Well, Bill, that's really interesting. Let's walk out to the plane together." So we walk out to the plane together, and I say, "Take this and read it. But it's the only copy I have. You're the first person to see it since it got approved. I just got it from the hotel."

Then he got on the plane, and actually, I had a seat in front of him, probably I had bought my seat earlier. [laughter] Whatever, and [it was] a small plane, like you flew in on. He took it back, and then a little bit later he came down and handed it to me. He said, "This is really important, isn't it?" I said, "You bet it is." Then he went back, and he sat down. A little bit later, he came back, and he tapped me on the shoulder. He said, "Can I see it again?" I said, "Yeah, but I have to get it back." Then when he came back to give it back to me, he said to me [. . .]

"Can you have twenty copies of this for me at the office tomorrow morning?" I said, "I'll get them." You know, use special messengers. I said, "You'll have them, you'll have this in your office tomorrow morning." Now he had every opportunity, and he's known it all along.

Then of course, then he—remember—then he went off the Board of World Wildlife Fund. What happened for a while? He left. Yeah, because what's his name came—Bass, remember Ed [Edward P.] Bass came on. Okay. He—that's right, he left. He only came back . . . . I'll take that back. He didn't come back, but he was on the Board. The next thing I heard he was on the Board at DuPont [E. I. du Pont de Nemours and Company]. So that's where he was. He would come back and stop in every now and then. Then he finally did come back for a while after Kathryn [S.] Fuller left. Anyway, the point is, he had it and he came back. We sat him down—I would catch him; Rich would sit there with me. We would talk to him about the problem. Always, Bill would say, "Well, you know, we really need to worry about the border. We just have this awful problem of things coming across the border. These poor sick people. These people exposed to pesticides." He would not buy into it. We just couldn't get him off of it.

ROBERTS: So what do you think he could have done? What would you have liked for him to do?

COLBORN: He was the administrator in the EPA at that time. He should have immediately set up some kind of a panel or a department or a division or something, devoted some—got some people started on it. Basically, he should have started working with the Health Effects Research Lab down in North Carolina because there were people down there doing that low-dose work, and he didn't. He just absolutely ignored it. The people that he put in, in the positions down there, wanted . . . . I'm not kidding you. I mean, I worked with the head of the Health Effects Research Lab. He would have done anything if he could have got the money and was told to, but he wasn't given much guidance. Of course, what happened was that the toxicologists took over immediately. They were in there big time.

So and industry was . . . well, see what happened was industry was prepared when the gray book came out. That's when they started their campaign. They began basically stalking me. They found out no matter where I was going to speak, they made sure they got on the agenda too. They insisted. They were following me, they hired . . . they basically joined with the American Plastics Institute, the American Petroleum Institute, the Chemical Manufacturers Association, Crop Life, the pesticide people and the food packaging industry. [They all] began to come together, began pouring money into hiring the best public relations firm they could get, and I knew they would end up at Ogilvy & Mather to basically carry this on. So there's a fifty-million-dollar effort, a public relations effort, from the beginning.

The pesticide companies—within the companies actually—began to say, "Yeah, you know, we have to be careful what we say because our record isn't very good on the way we've been trying to fight these things. But we have to keep endocrine disruption out of the press. We

can't let it get into the news. We've got to keep Colborn's name out. If we let Colborn in, we'll have another Rachel Carson." These are the kinds of things—you don't let this grow. I understood this from the beginning and that's why I always thought, "I'll just lay low. Let's get these other people out there." We need scientists who will speak out, but so few scientists will. [. . .]

[END OF AUDIO, FILE 1.1]

[END OF INTERVIEW]

INTERVIEWEE: **Theo Colborn**

INTERVIEWER: **Jody A. Roberts**
Elizabeth A. McDonnell

LOCATION: **Paonia, Colorado**

DATE: **8 August 2009**

ROBERTS: This is August 8, 2009. This is Jody Roberts. This is day two with Theo Colborn.

MCDONNELL: This is Elizabeth McDonnell.

ROBERTS: All right. So what? We're going to go back to *Great Lakes: Great Legacy?*, and you getting picked up by the Conservation Foundation . . .

COLBORN: Yes. And So I moved over there in two weeks, basically, and started right in digging into the literature. Of course, the first thing I looked for and got into was all the human health related to cancer, the usual, typical approach. It didn't take me very long to realize that the Great Lakes were no different. As a matter of fact, we have a lot of other areas of the country where cancer is much higher than there was around the Great Lakes. But I started digging into the literature and came across this man by the name of Michael Gilbertson over, over, and over again. People kept saying to me, "You've got to get a hold of Gilbertson."

Well, Gilbertson had been working for the Canadian Wildlife Service which was then called Environment Canada. He was the one who went out in his little boat, out onto Lake Ontario, and was the one who began finding all the problems among the nesting birds. He began making a lot of noise, and it reminded him of the kind of evidence that he had seen when he was working on his master's degree in England, that it looked like dioxin. So this really got to him, and it was very important to him, but he began making so much trouble that they moved him over and found him a position as a secretariat to a subcommittee for the International Joint Commission, out of the International Joint Commission's Office in Canada. Now this is the institution that was set up in 1909 to look at the boundary waters in the United States and protect those boundary waters. I'd heard that here was a man who had probably every paper that had ever been published on bald eagles. So I decided, well, the first thing that I had to do if I was going to do this story or write this report was get a hold of Michael Gilbertson.

So [I] set up to meet him, and he came to the hotel where I was staying in Ottawa, [Canada. He was a] very pleasant, nice young man, walked in the room and sat down. We all—I mean, Rich Liroff was there with me, and Sharon Green, who was also going to be a political

scientist in the United States working on our team—the three of us. It was just very interesting to listen to him talk. He said, "Well, you must come over to my office and see what I have, and I'll let you into the literature."

I said, "Well, you know we may have a hook here. We may have an idea where maybe we can get some attention for the Great Lakes because if the evidence you have on the bald eagles is really accurate . . ." Because at that time there were no bald eagles nesting on the shoreline of the Great Lakes. They had disappeared. I said, "You know, Michael, that's the symbol, you know, the bird of the United States. It's on our stamps. It's on everything. This should really make people become aware." He said yes.

So the next day Sharon and I went over to his office. Already somebody had found a reason for him to be called aside to go meet someone else. He said, "Here are the books. Take the books." So I started on one bald eagle book. I think Sharon took a book on minks. He had all these beautiful notebooks, everything beautifully handwritten, meticulously done. We were sitting there, and I looked up to her and I just said to her, "My God, I mean, we have hit a gold mine here. This is almost like a shrine." We felt like we had to whisper. That's the feeling we had sitting there looking at this work in front of us.

Then he came back, and we sat and we talked some more. The next thing I knew, he had set up a subcommittee for the International Joint Commission on what was called—at that time the committee was called—let me get out the name of it. I had to dig it out for you. What did I—I thought I wrote it—oh yes, the Bio Effects Subcommittee for the International Joint Commission. He was basically beginning to look at this sort of thing.

Anyway, he then began sending me information. Then Michael kept following my work. In 1990, he put me on the Bio Effects Subcommittee. I got a chance then to begin to serve as, sort of, a liaison between the two countries—Canada and the United States—on the International Joint Commission. I sat on a committee from then on right up until just about a year ago when all of these ecosystem health committees and everything were disbanded within the International Joint Commission, as more recently it's lost its perspective because of political reasons. So that kept . . .

ROBERTS: Were the reasons on both sides of the border or just the US side of the border. . . ?

COLBORN: Oh no. This is . . .

ROBERTS: Both sides?

COLBORN: Both sides, oh yeah. They just began collapsing. There was nothing left. It made it very, very difficult. So we still had the two offices in both parts, you know, Canada and the

United States. They're looking at the big issues, you know, water diversions, exotic species, introduced species, but [they] basically lost the perspective on chemicals, everything . . . that's what Michael was so concerned about when we started using the term "ecosystem approach." Let's take an ecosystem approach because immediately the International Joint Commission lost this perspective that they had been given in 1972 to focus on chemicals in the Great Lakes and get it cleaned up. That was the weakening of this. Michael has published paper after paper on what this means and the diversionary tactics that were taking place.[16] All the while [that] he was working for the International Joint Commission, he was getting these things published.

But basically what he did [. . .] was give me an opportunity. I needed work. So he gave me a contract after we got the book written to—basically, it wasn't a contract, it was a grant from the International Joint Commission to do a paper on the epidemiology of the Great Lakes bald eagles.[17]

ROBERTS: What year is that?

COLBORN: That was 1990 that was published. Michael began studying up these committees, or meetings, where he would bring in—and he had one big meeting where he brought in all the scientists. He even brought them in from Europe to look just at otters and chemicals. We looked at fish and chemicals. We looked at birds and chemicals, even broke the birds out into classes. So he began bringing all these wildlife biologists together. Then at the end of every meeting, he would sit down and write an elegant report. Out of that, everything that ever happened was published. The scientists who came to present published papers, so you'll see these strings of papers now. He was building this cadre of scientists and teaching them how to move forward. There was a man on this, in among what I called the Great Lakes Mafia. That would be Michael Gilbertson, Tim [Timothy J.] Kubiak, Glen [A.] Fox, early on there was even John [P.] Giesy in that crowd, but it was a growing bunch, and also Bill [William W.] Bowerman [IV]. They began bringing in the young biologists and they all worked together.

But, Glen Fox came up with this idea that we had to use Koch's Postulate, in other words, to test. If we don't—when you're doing epidemiology and can't show a cause and effect linkage, then you take a number of tenets that you would apply like you would in bacteriology in the laboratory. Okay, so you demonstrate that you can cause a disease with a particular stressor—it could be anything in this case—if you can cause a disease with that stressor, then you go back out and you try it in another species. You have to show that the effect took place after exposure, not before. So you had to show the time order sequence. You had to show this,

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[16] M. Gilbertson & D. Carpenter, "An ecosystem approach to the health effects of mercury in the Great Lakes basin ecosystem," *Environmental Research* 95:3 (2004): 240-246; M. Gilbertson, "Male cerebral palsy hospitalization as a potential indicator of neurological effects of methylmercury exposure in Great Lakes communities," Environmental Research, 95:3 (2003): 375-384; M. Gilbertson, "Causality: The Missing Link Between Science and Policy," *Journal of Great Lakes Research* 19:4 (1993): 720-721.

[17] T. Colborn, **"**Epidemiology of Great Lakes bald eagles," *Journal of Toxicology and Environmental Health* 33 (1991): 395-453.

again, this ability then to reproduce this effect someplace else. It was a whole series of tenets that you had to write your papers by, and that's how we wrote our papers. If you go back through the literature you'll see, because—and it still holds—with epidemiology we're never going to be able to show true cause and effect. So that was a whole thing that Michael started and got going, but it was Michael behind me all the time.

As all this came together after we did *Great Lakes: Great Legacy?* and I began pulling it more and more together, and could see what was there, I used . . . what I did when we went to our meetings . . . our meetings were usually on a Monday/Tuesday. I would fly up over the weekend and go birding with the Gilbertsons and stay at their house and then move into the hotel when it was time to go for the meeting. But on a Sunday morning, I can remember this so well, spreading everything I had out on the floor. I said, "Michael, now, I want you to come look at all of this." I put this all together, and I had it spread across the floor. I said, "Now, let's take it step by step by step."

We got from there, and we got over to here. I said to him, "Should I quit? I mean, is there enough to move forward? Is this something that I can do?" I mean, you were asking me—I saw this. I saw what the implications were. I said, "Michael, I can't do it alone. He said, "You've got to do it. You got to do it." Then we went out and sat and had lunch with June [Joy Kay Gilbertson]. June was in the kitchen preparing and listening half the time. We sat down and I can always remember that meal because that was the turning point of my life where he gave me the courage and the encouragement in his quiet way. "Yeah, let's take this and let's work on it."

He has always been behind the scenes. Every time I had a question, I would try it on Michael. He always knew how to come back in terms of how policy would look at this and how it didn't fit into policy. I think a lot of it—and this is what Michael suffered—this disconnect between the evidence that's out there [and] the willingness to take that evidence and do something with policy to tackle it. That's the problem we have today, this tremendous disconnect between what we know is going on in the laboratory, what we can deduce from the laboratory work, [and] what we're finding in the human population with absolutely nothing within government or within the regulations that allows anyone to take that information and apply it so you can protect public health. There's that big block in the way. It's there in Washington, DC. It's there in Ottawa. It's there in Europe where the European Union is meeting. Every one of these bodies want to do something, but we've got to this point where because of the way we had structured the law, the law was never designed to deal with something this insidious.

ROBERTS: So what were his suggestions for taking what he was seeing in the field and starting to craft a way towards changing that policy, at least on the Ottawa side?

COLBORN: Well, more and more papers, more publications, get it in the peer-reviewed literature. They're not going to take any anecdotal information. Let's take what is . . . when

you're working with wildlife, a lot of it's anecdotal, you have to go out and observe what they're doing, where they're living, how they behave. You have to weave that all into the story.

ROBERTS: So really what he was adding was more a systematic approach to the collection of the data . . .

COLBORN: That's right.

ROBERTS: So that it didn't seem so haphazard.

COLBORN: It was to build the evidence.

ROBERTS: Right. So in some ways it seems like he took what is your initial spreadsheet of looking at species and effects, and that spreadsheet becomes a manifested system of approaching the topic . . .

COLBORN: That's right.

ROBERTS: Through the types of conferences that he started to organize with you and that also then perhaps provided a lot of incentive for the way in which you decided to structure what you wanted to do with the Wingspread Conference, is that right?

COLBORN: Yeah, very much so because the Wingspread Conference started around that handful of three wildlife biologists, Glen Fox, Michael Fry, and Tim Kubiak.

ROBERTS: Was there a reason that Michael Gilbertson didn't participate?

COLBORN: Because Michael had never published. He wasn't . . . . Michael was left out, and yet there was no place there for him because he would only be talking policy. This was a pre-policy meeting. This was to—how do we focus in on this issue? Is this an issue we really need to go ahead with? There was tremendous frustration on the part of all of them. I can remember, you know, saying something to Tim Kubiak about, "Do you realize what this means in terms of human health?" We were talking, we were driving across the border. I had to fly into Detroit, [Michigan]. They'd pick me up in Detroit and drive into Canada to go to the meeting. Kubiak's

just sitting there saying, yeah. He said yep. And he just agreed with me. He said, "But I only work . . . if I talk like this in my office," he said, "I'd probably get demoted."

ROBERTS: What office was he in?

COLBORN: He works for the US Fish and Wildlife Service. He still works for the US Fish and Wildlife Service, and he's still very frustrated. So great story. You're going to have to interview him. He was there.

ROBERTS: Right.

COLBORN: It's very interesting. So they basically got up and what they did—all they could do—was show what physical evidence they had, population effects. Of course, Tim came with his egg work, you know, Tim was very much involved in that very elegant egg switching—[that] very, very dangerous effort that they applied. You know, that they arranged in the Great Lakes where they took the tern eggs and did a three-way switch, they switched eggs in nests in populations. They switched nests into the laboratory. What they demonstrated was that those animals . . . basically, that it was parental, a lack of parental care. It's a very elegant study.[18]

That was for me a very turning point because my concern was all along, "Okay, so we affect sperm; well, it may reduce reproductivity. But what is it doing to the brain?" They demonstrated this definite change in behavior [and] in the success of the populations because of the behavior of the parents, [the] lack of parenting. That was the big thing that came through to me, because that's always been a problem since about 1930, 1940, where the news began talking about parents and the lack of parenting on the part of the public today and mothers and fathers today. It struck home, you know, all of these things kept saying . . . . I guess I was always older and I could see it in putting it together. It was that constant because we had meetings every three months. He kept having his meetings. We kept coming in. We had excellent meetings. Then we would report back. Then what happened was George [H. W.] Bush was elected and the director of the office in Washington, DC, actually immediately brought him over to World Wildlife Fund to talk with me. This was right after the book came out. Gordon [K.] Durnil. He had raised more money for George Bush's campaign and was basically a hardcore Republican out of Indianapolis, [Indiana].

ROBERTS: This is George H. W. Bush.

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[18] M.H. Zile, C. Summer, R. Aulerich, S. J. Bursian, D., E Tillett, J. P. Giesy, and T. J. Kubiak, "Retinoids in eggs and embryos of birds fed fish from the Great Lakes," *Environmental Toxicology and Pharmacology* **3** (1997): 277–288.

COLBORN: Yes, the very first Bush. Basically, I was quaking in my shoes when he came in. But David LaRoche brought him over, another real character in this because David understood all this. We sat—Rich Liroff was there—and we sat. David said to me, "Tell Mr. Durnil what you know. Tell him what happened at that Wingspread meeting." So I talked about DES, had to explain to him what it was because the man never cracked a smile. He didn't say a thing.

What I found out later was he knew a lot about DES, because his wife's father and brother worked at Eli Lilly Corporation. They were the ones who helped develop it into a medication. They used—and he brought it home. They brought it home. They lived on a farm outside of Indianapolis, and they hand-broadcasted DES to the chickens and they started the Capon business. His wife had breast cancer. He had a son who was born with some serious problems. He personalized it, but I had no idea when he was sitting there. So he left. He asked a lot of good questions, and he left and I looked at Rich Liroff. I said, "Well, what do you think?" He said, "I have no idea." Three days later, Gordon Durnil called me and said, "I want you to come to the office. I'm bringing everybody down from Canada. I want you to tell that story again. Then I want you to just stay and help us write our fifth or sixth biennial report." I mean, again, it's one-on-one. You never know where you're going to find the support. But with this message, no matter, it seems, who you talk to, if they listen to you and they really understand what's going on, it strikes home.

ROBERTS: So how do you think actually having the conference changed the type of message that you were able to give to some of these individuals that you wouldn't have been able to do had you not had this collection in 1991?

COLBORN: I had courage to go ahead and push it. I mean, to lay it on them and say, "This is how much we know. Look at this evidence. You know, we have it from here. We have it from there. These experts now agree." The remarkable thing was, if you remember that report, they said that if we do not reduce the use of these endocrine disrupting chemicals in the environment, and we don't abate what's in the environment—something to that effect . . . . I had it memorized at one time—we're going to see wide-scale dysfunction at the population level. I went back and looked at that about a year-and-a-half ago, and here we are. They had no idea that anything could happen this fast when they were sitting there, I know that day. They came to agreement on that. But here it was only thirteen years later, and we have evidence now that we have pandemics of eight, nine, ten or eleven already documented endocrine-disrupting human disorders.

ROBERTS: What were some of those? Can you list off some of those?

COLBORN: Yeah. ADHD. Well, okay I'm trying to go down the list. Okay, but my list, [which] includes where we now have evidence for prenatal exposure could start with ADHD,

autism, diabetes, early diabetes, adult onset diabetes, prenatal exposure leading to delayed cancers in [the] prostate [and] breast, Parkinson's, Alzheimer's, and this has all been traced back to all kinds of autoimmune problems, arthritis. I usually have this thing that I can just shoot right off, but it's that general list that now—and thyroid problems, rampant.

The problem is that except for cancers, there are no registries for these kinds of disorders. In other words, when a physician sees a patient with a particular bacterial or communicable infection or cancer, it has to be reported. But they're not reporting every patient that they prescribe for thyroid medication or diabetes medication. So there's no way to do this. I will say quite frankly, if we had single-pay insurance we would have caught a lot of this years ago because the insurance companies knew.

The insurance companies do not like to insure, and they don't want to insure a child that's born with Hypospadias because they know that child has a much greater risk of having fertility problems and also having early testicular cancer. These are people who now can't be insured, and I have had doctors come out of the audience and tell me, "I try not to get it on the birth certificate. If I can, I wait until I start the surgeries." Quite far—as far past birth as possible, so that they don't disallow these patients. The insurance companies have known a lot of this. We should be knowing what those insurance companies know and we don't know.

MCDONNELL: Do they react at all to your initial consensus statement?

COLBORN: Pardon me?

MCDONNELL: Did you have mixed reactions to the initial statement you made from the conference?

COLBORN: Well, immediately, you know, there was again a very concerted backlash on the part of the pesticide people, you know, the usual companies, corporations. They were concerned for a while. It was really interesting. For a while, the pesticide [people] said "Well, it looks like she let us off the hook, didn't hit us very much with pesticides." It was really very interesting, but they were always there. I would go speak, it was amazing—several big places where I went to speak and at the Press Club where I was doing a press conference, there was a table just set aside for the public relations people who all sat there. You know they're there. They're just all there listening. They don't take notes. They don't smile. They never react, every one of them sitting very quietly just listening. They're there.

The thing that annoyed me so was I would be invited by a team working within EPA in a particular area where they were having a problem and they would say, "Well, let's bring Theo out. Let's talk to her." They would find out about this. They always knew where I was going. They immediately insisted that they have someone there talking at the same time. There was

always someone there raising a question, placing doubt on what I was saying, [but] always treating me with respect. I was never publicly—anywhere that I can remember—addressed so that it would make me mad. The only kind of people who came upon me, and I'll tell you this quite frankly were cancer groups. And very blatantly and very loudly, women treated me terribly because I would not call these cancer-causing chemicals. Why wasn't I taking a strong stand on cancer? At that time, I couldn't. But that really hurt.

ROBERTS: So it wasn't that you couldn't—or it was that you couldn't, not that you wouldn't, is that the case?

COLBORN: There was no way. I couldn't because I didn't have the evidence. There was no evidence to prove that these things were causing these cancers, other than . . . even at that time, we weren't sure the breast cancer—the DES mothers were getting breast cancer. That has only been definitely confirmed within about—I would say—the last five or six years. That's definitely from the epidemiology work that's been done. That's where I took a beating.

I think what really hurt the most, let me see . . . . I just wanted to make sure that you've got the role of the International Joint Commission behind this, for years it was really good until after Gordon Durnil stepped down. Then they appointed someone from Michigan, who has been—he was just the death of the—as far as I'm concerned, he led the International Joint Commission into—basically, [he made] it a useless and just a waste-of-time type of effort. I think there could be a change now. All it takes is one good director appointed in each country and you can move forward again. But the Canadians buckled under the appointment after Gordon, but Gordon was remarkable because he did get out and he started working with the paper industry.

That was when—and it was an International Joint Commission meeting where the proposed approach was no longer wait and see, but we will use the reverse onus. I can always remember the International Joint Commission, E. [Edmund] Davie Fulton sitting up there on the stage—a heavyset man and big, and saying, "And it is time to incorporate and start using the reverse onus." A lot of people turned and looked at each other, "What does he mean by that?"

ROBERTS: Is that the sly way of saying the precautionary principle?

COLBORN: The precautionary principle.

ROBERTS: So that's the other big piece that comes out of the consensus statement, right? There are two pieces. One is these are all the things that we now know if we collect data across disciplines.

COLBORN: Yes.

ROBERTS: The other is that now that we know these things, we ought to take a much more precautionary stance in the way in which we regulate our chemicals.

COLBORN: That's right.

ROBERTS: That second part seems to have really fallen by the wayside over the last decade, while the first part has grown and grown. Can you talk a little bit about why someone would say reverse onus instead of precautionary principle? Why there's the politics of using precautionary principle in the EU versus the stigma attached to it in the United States? Why that was maybe abandoned as a strategy?

COLBORN: Well, immediately the trade associations just plowed in on it, completely. They did.

ROBERTS: What is it about it that you think makes it so easy to attack by the trade industry? Is it that it sounds too soft? Is it that . . .

COLBORN: It's too vague; you could turn off anything. In other words you could, you know . . . any little thing you'd want you could turn off. That's why I've always tried to avoid it, praying that we could get enough evidence, which we have now on chemicals. That hasn't worked because of the structure we have within the regulatory . . . what you can regulate and what you can't regulate and how we determine what we regulate. It's the use of risk assessment that allows you to determine, "We will let a certain percentage of the population get sick and die. We can afford to lose them." It's all based on dollars. If we would go back to the point where we allow no risk when we have that much evidence—and we have it with dioxin, we have it with BPA right now. There is so much evidence that there should be no question that this is a chemical that we should not let get into the womb environment. [. . .] Did we get to *Our Stolen Future* yet?[19]

ROBERTS: Well, so I was going to say, I think the next transition really is post-conference and now you're writing the book with Pete and Dianne.

[19] T. Colborn, D. Dumanoski, and J.P. Myers, *Our Stolen Future* (New York: Dutton, 1996).

COLBORN: Okay. So we get the book done. You know, and the book is out, but about two months before that, we decided poor EPA, they're in a terrible predicament. We should let Carol [M.] Browner and Al [Albert A.] Gore [Jr.] and certainly Bill Clinton know what's coming because this book really points a finger at EPA. So the book was sent over there for somebody to read. I was called in November. The book was supposed to come out in January. It didn't come out until March.

What happened was somebody said, "You're going to be so happy. We now have this executive order by Bill Clinton to basically establish these children's Centers of Excellence, the Children's Health Initiative." I was so excited. Somebody sent me a copy of it, and I sat down and read it, and I cried. I absolutely cried because it started at birth. There was not a mention of the embryo or the fetus in there. They absolutely refused to touch it. They were scared stiff. They would not use it.

So what we did was set up all these Centers of Excellence to develop cures and treatments for these disorders we were trying to dispel. Walked right into the hands of those corporations that could profit from every effort they've done. To me, it was a terrible, terrible disappointment. I've had my ups and downs through all of these years as you can tell, low times where you go—that's when I go to the Michael Gilbertson's. That's when I cry on Fred vom Saal's shoulder because he cries with me, that sort of thing. So Lou [Louis] Gillette [said], "Okay, guys, what do we do now?" The old hardcore guys who came in on this in the very beginning.

So it's that—basically what happened then—terrible, terrible misunderstanding. People see something and then other non-profits coming along and saying, "Okay, we're going to prioritize chemicals. We're going to get rid of them." But we don't have the tests to basically demonstrate if—because we need that evidence, I agree—to show that this is going to happen. Then of course, the other big thing was when we had EDSTAC [Endocrine Disruptor Screening and Testing and Advisory Committee], and then we had EDMVS and then the animal rights people moved in.

ROBERTS: So at the same time, Gore does write the introduction to the book.

COLBORN: Yeah.

ROBERTS: I guess you don't tell the vice president no, even if you're disappointed with . . .

COLBORN: That's right.

ROBERTS: What's happening.

COLBORN: Because it was very, very interesting then, everybody wanted to translate the book. So when the German book came out, if you looked at the cover of the book [in] big letters, "Forward" [is] in little tiny print [and] "Al Gore." Up in the top on the page is "Theo Colborn, Dianne Dumanoski and Pete Myers" in little tiny print, and they called it "Al Gore's Book" in Germany.

ROBERTS: Wow.

MCDONNELL: Wow.

COLBORN: Yeah. So it did help sell the book.

ROBERTS: But there are two important pieces there. So one, it helped to sell the book—so maybe three. This seems to fit with the roughly 1996-era of Clinton and Gore's reinvention of government initiatives.

COLBORN: Yes . . .

ROBERTS: Especially around the environmental issues, and this is the same time that green chemistry is being established, the Presidential Green Chemistry Challenge Awards are being established. So they're looking for ways to reach out differently . . .

COLBORN: That's right.

ROBERTS: Even if you're saying that maybe behind the scenes, they're not actually doing all that much that's different. But it does also seem that they're . . . the hopeful piece is that because of the increased sales and the increased translations, at least according to Pete when we interviewed him, it was really the international effect of the book that really took hold. That even though it didn't do in the United States what you had hoped it would do, it did do that in some other countries. Of course, he talked a lot about Japan . . .

COLBORN: It did. Well, it's like Japan. I mean, you know, over there I was a hero. That particular period of time it was Janet [W.] Reno and me, everybody knew in Japan. They like big tall, white American ladies. [laughter]. When they gave me the Blue Planet Prize, they

picked me up; I mean, they kept me under guard the whole time I was there to keep people away. Each time I went back to Japan, and I would say, "Well, I'll come back, but you have to take me bird watching. Please, can I get out into your country? I wanted to see the country."

So they made arrangements for me to go bird watching, but then they had to keep the people away because all these people wanted to come watch me bird watch, believe it or not. I'm not kidding you. [laughter] They had them yellow-taped off, and they could stay back as we walked through the beautiful park—remember?—right there in Tokyo where the palace is. Just unbelievable. At that time, when I went over for the prize—that was in 2000, 98 percent of the Japanese public, you know, they had done newspaper surveys. The *Yomiuri* did it and another paper; 98 percent of the public knew environmental hormones were endocrine disrupters and they knew Theo Colborn.

ROBERTS: Wow.

MCDONNELL: So did it change how things were done over there? After the book came out, did it change any of their policy . . .

COLBORN: Oh my goodness, of course. They started cutting out Bisphenol A out of tins and cans way back. They went to their incinerators because everywhere you go you see an incinerator over there. Each one's decorated a little differently, and each one is supposed to be architecturally prettier than the other. But they really ramped down on dioxin. They did a lot, definitely.

ROBERTS: So how did that match up with your experiences in the United States? I don't want to say it was a disappointment because maybe it wasn't a total disappointment, but did the book have the effect that you were hoping for in the United States?

COLBORN: Well, I know a lot more people became aware because I mean, even today I keep hearing from people. It did, but unfortunately, [there was] a very slick, very carefully orchestrated and well-planned manipulation of the news, and the control of the news—remember we couldn't—reporters would write articles. You'd be surprised how many documentaries I have sat in on that we thought were going to make it and were spiked.

Remember *Assault on the Male*, the one the BBC [British Broadcasting Corporation] did.[20] NOVA bought it, they were going to show it in this country, they took one look at it and sent it back because they didn't want to show a penis in this country. So then Discovery Channel bought it, and they were going to start showing it and even Discovery showed it. On

[20] *The Estrogen Effect: Assault on the Male*, BBC, 1993.

the first night, they showed on a Sunday evening, Labor Day weekend at the same time as 60 Minutes. They showed it again that night at midnight, and then they shut it down. The agreement was they were going to have it available on DVD, you could buy it. That never happened.

So you see, getting the message out became impossible. The book was the only vehicle we had in this country. That didn't happen in Germany, France, Europe, England, Japan. Over there newspaper reporters wrote their stories, they wrote about the research and no one at the end had a chance to speak from industry. They just told the story, while they had that opportunity to tell those stories . . . in Korea, the same way, I know now, I found that out. They were able to tell it the way it was without any second party expressing their concern or anything like that. Then gradually what happened was the US Trade Associations formed what they called international collaborations. Then they started weaving their tentacles through in Europe. Basically, that's what happened, they moved ahead in Europe, they moved ahead in Japan. Then suddenly, the press changed. They began raising doubt, obfuscating the issue, and actually lying, lying in many instances. That's how things have changed. So they were ahead of us at first, now they're getting behind us, but then I think we really got behind.

One of the best scientists, I think, coming out of Europe—and I'm not going to get him in trouble—but he came with me to the Hill to speak to some legislators. He said, "You know, you used to be ahead in this country. Now we're getting behind, because what's happened to you is now happening over there to us. You have got to move back. You have got to take over on this issue. This is your issue. Please help us because we're losing over there."

ROBERTS: Who was this?

COLBORN: That's what's happening now.

ROBERTS: Who was this coming over? You don't want to say.

COLBORN: I'm not going to get him in trouble because he stuck his neck out, but he came. He did this for me. [He is] a highly respected, wonderful person.

ROBERTS: That's a shame.

COLBORN: Hmm?

ROBERTS: I said that's a shame.

COLBORN: Well, it is, but this is what has happened. It's because of the control of the media, definitely media control. It's been very, very difficult. Now lately, we've been making these breakthroughs. Of course, I read above the fold every day and think everybody in the country is reading it, and they're not, absolutely not. In the last few years, I've needed assorted doctors for eyes, you know, the little thing on my nose, and other health effects and go in and talk to the doctors. Even my own physicians who are taking care of me don't know what endocrine disruption is. That's sad. That's really sad.

ROBERTS: So what's the next strategy?

COLBORN: The next strategy is to get through to the medical societies.

ROBERTS: How are you . . . what's the plan for doing something like that?

COLBORN: Well, I don't know. That's been very difficult because they want to shut you out. They do not want to get involved. What's so difficult is that they all have beautiful journals, magazines, and their biggest subscribers, and [those] who pay for the publication of those journals are the pharmaceutical industries. This makes it very, very difficult to make a breakthrough there.

My wish is, hopefully, that every physician before he gets an MD has to at least take a CME course, a continuing medical education equivalent course in what is endocrine disruption. But we're still being told that there's just not enough time on the agenda. They don't have time for that. They get what, a day for nutrition? They get a day for toxicology. Well, they need another day, because endocrine disruption is not toxicology.

ROBERTS: What would you want if you had a continuing education course for a doctor on what is endocrine disruption? What would you expect that doctor now equipped with one day of that introduction to do?

COLBORN: I would expect that doctor to suddenly begin to realize that the condition he's dealing with could possibly have happened prenatally, that this is a predetermined condition and realize that you cannot cure or change the way someone has been basically constructed and programmed. Also that they need to think more about prevention and start introducing prevention into medical care. That's the big goal.

ROBERTS: Yeah.

COLBORN: Basically, what we have discovered is that if you intend to have children, you have to start thinking about that when you're in your teens and even earlier. Your mother should have been thinking about it. But this is the kind of training we do not have. It looks like now . . . . I'm getting fascinated because I live in the Southwest and I have an opportunity oftentimes to meet some Native American elders. Because if you sit and talk with them, their wisdom is just so precious because basically they thought in terms of seven generations. When they knew that a man and a woman were going to bond within their tribe, they went off for a while and basically cleansed themselves, got away from the smokes in the cabin and the tents and that sort of thing. There was this cleansing period because they knew it was important. We lost all that touch with what and how we're created.

ROBERTS: Yeah. So in some ways there's a lot of pieces of this story that are . . . those valleys, not just the peaks. So things were rough. It seems like at a lot of points you were getting rebuffed, right. There was a lot of hope that the EPA would do things, the administration would do things, that Congress would do things. Almost, time after time, they didn't come through with that. But at the same time the field has grown dramatically even though those larger things weren't happening. Can you talk a little bit about what mechanisms were available that kept some of this going, that allowed fetal basis for disease to actually grow into a pretty large piece of the research agenda, even though it seemed to be under the radar?

COLBORN: I think possibly because there are enough older scientists. There is a wonderful group. It's a fetal origins—I think, what do they call themselves—Fetal Origins of Disorder, Disease Group, and it's an older group of, sort of, what would you call them? The wise men, the sages who have recognized it, but again, realize the difficulty of trying to deal with it. I think it's the young people coming through. So many, many people that I meet say, "Well, after I read your book, I changed the way I began to think." We have more and more people getting involved with this concept and can understand how life forms.

Here's my problem. If we had spent as much money on what I call "inner-space research," instead of pouring it into trying to get to another planet, going somewhere, just one-tenth of that into inner-space research, we could understand better how a baby is constructed. We don't know. We know so little from fertilization to birth, thirty-eight weeks out of an individual's life that's totally lost. We know nothing about . . . and we need chemists who are willing to get in there because it's all chemically driven. Hormones are chemicals, and they're driving, they're building the construction of an individual.

I want inner-space research to become the highest funded research in the twenty-first century. When we shift some of that money from outer space to inner-space and apply some of the technologies we use to get to outer space, which took the production of the kind of

chemicals that are causing the problems in the womb right now . . . we need this kind of research and that's what we have to do.

MCDONNELL: Does that seem possible?

COLBORN: Is it possible?

MCDONNELL: In the near future . . .

COLBORN: I think if enough people suddenly realize how sick they are and their families are, that it may happen. But it may be too late because while the reproductive organs are developing, so is the brain. The brain—there's a very important part of the brain that has to develop as well, very early on, that begins to develop around the second and third week of gestation. Very early in the stages of, you know, the neural tube and that stage of development. That affects the hippocampus.

The hippocampus is that part of us that makes us separate from other animals. This is where we can take information and process it and arrive at some conclusions about the consequences of what it means that we're doing, somebody else is doing, or could happen. It's also where we learn to bond, to love, to feel empathy. Unless you can socialize with someone and feel empathy and understand where they're coming from, we can never resolve any problems.

I'm very concerned about that, those two elements of what can happen during those first thirty-eight weeks of development, which people are ignoring. It's very difficult to study. This is where we need some money. We are not going to have enough people by the time . . . everybody is so sick, we say, "Oh my God." If you look at the odds today and the statistics that are out there, not one child is born today [that] has better than a fifty-fifty chance of not being programmed for one of these disorders, and also being someone that has to be cared for or take some kind of medication to survive through to adulthood. That's a big concern.

ROBERTS: So is it the . . . earlier, you listed off some of the epidemics, or the pandemics, that you saw happening. It seems like hippocampus—some of those that you mentioned—so I'm guessing that's not coincidence that you have something like Alzheimer's, autism, ADHD. So these are mostly behavioral . . .

COLBORN: That's right.

ROBERTS: Sociocultural, sort of, behavioral issues associated with living in a society and having functioning social skills. I wonder about the difficulties though in . . . . I wonder about a lot of the difficulties, but one of them that we mentioned yesterday, I think after the interview, [was] of adapting that research that you have from animals on those behavioral skills. So taking what they did with the bald eagles and some of the other bird species around the Great Lakes. You were able to very clearly demonstrate that there was a behavioral problem associated with parenting skills. Now how do you put that into a human context and tell someone that you're a bad parent? You're a bad parent because you don't know how to properly prepare because you had this fetal exposure . . .

COLBORN: I know.

ROBERTS: What is the way in which we start to translate some of this information from the field into something, to trying to do what Michael Gilbertson wanted to do and translate some of these observations into real policy actions?

COLBORN: That's the difficult part. How do we reach those . . . . I'm working right now with a handful of highly respected people in very high positions who understand this. They understand the implications of it thoroughly. It's probably because I know they appreciate what I'm doing and they make sure I see them at least once every couple of years, so we can sit and go through what we know. They are working in positions where they can get a lot done.

But again, you've got . . . it's always some major crisis. We were making—right around, I would say, September 2001—we were really making progress. Budgets were coming up around the world where money was going to go into this kind of research, more and more. Canada, Europe, all over. Then at 9/11, everything was lost. Money—this is the last thing anybody is going to fight for money for when you've got terrorism to deal with.

So terrorism came along, which could very well be a product of this problem of people being born this way. I realize there are cultures, there are societies that also thrive on this kind of—historically we've always known they've been prone to this kind of lifestyle or social—I call it social dysfunction, but they think it's normal, we don't—that sort of thing. There's all that to deal with. No, it's very, very discouraging; it really is. If we can get this idea infected into enough people. It's interesting, I was working on the "Critical Windows of Development," very early stages, and this young man walked in here with his son, being raised very progressively in many ways.[21] The child sat down on the floor and as he and I were talking and then he said to me, "Can I use your computer?" So this would be about a five- or six-year-old. I said, "Well, I don't think so." He said, "Well, I'd like to do some computer games." I said, "Well, I'll give you a computer game."

[21] The Endocrine Disruption Exchange, "Critical Windows of Development," accessed September 29, 2009, http://www.endocrinedisruption.com/prenatal.criticalwindows.overview.php.

So I took him in, and I said, “Now here’s this game.” I said, “Do you know why you were born? I mean, how you were born?” He said, “Oh yeah.” He said, “My father gave my mother a sperm.” He had this thing all worked out, and he grew up in his mother’s belly, he understood it. So he sat there and I said, “Okay, now let’s go back and look at this.” I showed him the critical windows of development—the normal page first. I said, “Now this is the first week. Now this is when the sperm entered your mother’s egg.”

“Oh yeah.” The kid’s sitting there listening, you know. Then we go through, and I said, “You pick a tic, and you click on a tic, and we’ll see what happened.” He said, “Oh wow. Is that when that started to grow in me?” You know, he was really fascinated by it. Then I said, “Well, there’s some chemicals out there though that can get in and could have got into your mother before you were born.” He said, “Oh yeah?” You know, really interested. I said to him, “Yeah. You want to click on that?” He went up and clicked up on Bisphenol A, and everything turned red. He was just wowed; he thought that was the most interesting thing. He caught on. You know, it was really interesting. So I said to him, “I’m glad to see you don’t have anything plastic in your hand.” He said no. He said something to the effect that, “But I’d rather have one of my games.” You know, that was the thing, but he caught on.

If children could be—you know, we’re puritanical. I realize now I should have told a lot of things to my children, that I should have discussed [things] with them that I didn’t because I was raised so puritanically. We have to accept that somehow, someway, people are going to have to understand more how we got here.

ROBERTS: So talk about that project and use that as a way of maybe stepping back and talking about the endocrine disrupter exchange that you’ve been . . .

COLBORN: Well, let me see. Where are we? How did we get to . . .

ROBERTS: Well, we were on the book and we talked about the effect of the book . . .

COLBORN: The effect of the book. Now let me see what I wrote here, so I have everything. Okay. Oh, got through here. The book, okay. Okay, why the book was written basically was because the foundations, who were very interested in my work, decided that somehow we had to get that into a popular press book. So you knew that. I think we got that in, didn’t we?

MCDONNELL: We talked about that yesterday.

COLBORN: The Pew Fellows, I think we got that on tape yesterday. The book—well, of course the book polarized—reviews were polarized about the book, yes. Very interesting, and I'm sure Dianne or Pete told you about our experience when we went to see the *New York Times*. Pete told you about that.

ROBERTS: He did indeed.

COLBORN: Okay, I don't have to tell you.

ROBERTS: You can tell your side.

COLBORN: No, I mean, it's just . . .

ROBERTS: He was very disappointed.

COLBORN: Oh, it was unbelievable. It was unbelievable. Talk about rude, you know. I think the way we were treated at the *New York Times* basically was that this was such a truly new idea and people were so hooked on toxicology and these were toxicology-driven, corporate-funded type people who were thinking in terms of the bottom line. I was totally unknown. Remember, I was an old lady bird watcher who had come out of nowhere, and if it hadn't been for *Great Lakes: Great Legacy?* no one would have even known who I was.

I mean, I came from nothing, so I had no credibility behind me in terms of . . . and that's why I still sit here and wonder why people call me because this has not been a lifelong career where you find your experts. They were always in that field. Then also quite frankly, Pete was called a radical. I mean, he was wild, Pete was way out there. Dianne was a newspaper reporter, so you know, they classified her as a reporter.

ROBERTS: But this is interesting—right?—because the reporters, the people who would have potentially written the review for the *New York Times*—they're not bought into the system of toxicology. They don't have a vested interest in the things that you're challenging.

COLBORN: Well, we had a very good review. Did you know we had a very good review in the *New York Times*? In the book section?

ROBERTS: So then what was the conflict with . . .

COLBORN: We were turned down by Nick—what's his last name—I can't remember the names of people. He was the science editor for the *New York Times*; that's who they set us up to meet. He just cut us off, but we got an excellent book review in the *New York Magazine* section. We were on their list for ten weeks as a bestseller. It was just Nick—Nick [Nicholas] Wade. Dianne and Pete were crushed, but I had been so treated like this already by major corporations. I wasn't surprised, they were stunned. But I was very . . . . I was disappointed, but I know they were very hurt, truly hurt.

But see, then what happened was . . . and this was, sort of, the little tangent that I went off on and spent quite a lot of time. Through Series—you know what Series is . . . it's that group that tries to have industry and policy people and scientists talk with each other—I received an invitation to meet with Proctor & Gamble sometime in December. I'd have to go back and get the year, I need to go back into my notes. But, they wanted to talk with me about my concern over the way George [P.] Daston had been behaving throughout the EDSTAC meetings.

ROBERTS: Who was George Daston?

COLBORN: George Daston worked for Proctor & Gamble and served on the EDSTAC. He was their chief toxicologist and happens to be a very close friend of Bob [Robert J.] Kavlock, who works for EPA. Turn that off a minute. It's clicking, right? [. . .]

ROBERTS: So let's talk about EDSTAC, because of its close proximity to the book. Then also something you mentioned in terms of EDICOR [the Endocrine Disruptor International Cooperative Research Effort], and you can maybe walk us through both of those.

COLBORN: [. . .] Okay. So then, of course, the first thing that happened was that I got a call from EPA from Lynn [R.] Goldman and a couple of other people over there that she had pulled together to work with, there were Gary Timm, Tony Maciorowski, people that I'd known anyway. They said, "Well, we've got to set up a committee." So they said, "How would you do it? [. . .] You created all this, now help us. We're going to have to establish a committee."

So the plan was to get no more, again, than twenty-five people. They would be bench scientists, guys doing the research. That was the plan; they would go ahead and do that. What happened was there was so much pressure, especially from the pesticide people, I know they were really, really pushing the EPA at that time, [that] it turned out that there was barely a laboratory person there. There were people like George Daston, who was the chief toxicologist, but had left the bench and was strictly locked into the old traditions. Ron Miller from Dow [Chemical Company], a retired Dow employee or some other—maybe it wasn't Dow—but another corporate employee who was retired, you know, and now they hired him back on

contract. These people were all basically given this as part of their job to sit on this committee. Not one of the original people who had even looked into endocrine disruption sat at the committee, on that committee.

I was there. I did not want to be there, but they kept insisting, "No, you need to be there because you started all this. You know everything that's going on." They put Ted Schettler on, and we managed to get Tim Kubiak on, but he could only speak for the US Fish & Wildlife Service. So when it came to any kind of assays or anything that had to do with human assays or laboratory work, he couldn't do it. He had to talk to and cling to basically the wildlife stuff, how we were going to come at this looking at the egg. His idea was let's go back to the egg. So there we were basically . . . and then Gina Solomon representing the NRDC [Natural Resources Defense Council].

Then the thing that had to happen was that the support groups wanted—health support groups—wanted representation and the minorities, so then we began to get people who, again, know nothing about the science sitting on the panel. This panel grew to thirty-nine people. You go back through and, some day if you want, I can sit and we go through where they all sat. There had to be a representative from each of the agencies in the federal government. The government's full of people that they put on these kind of panels. They're placeholders. They know nothing about the problem, they never make a wave, they never contribute anything. I tell you, quite frankly, the government representatives who sat on that committee had nothing to contribute. It was taken over immediately by the traditional toxicologists. This is where we began to get in trouble, so that's how EDSTAC began to operate.

ROBERTS: So what was the mandate?

COLBORN: The mandate was to come up with in two years a program to establish and be able to detect chemicals that can interfere with the estrogen and other endocrine systems that the administrator deems important.

ROBERTS: How possible did that seem when it all got started? Did it really seem feasible that in two years EDSTAC would be able to come up with this?

COLBORN: I didn't think they could do it. I thought it was impossible. I felt the law got way ahead—I was very upset when I saw the law. It happened too fast; it was done without thought. Again, at the last minute it was slipped in as the result of some activist non-profit organizations. It was not the one I was working with, but that type of thing. It moved much too fast, and I knew we weren't ready. What I was so concerned about was that people that should have been doing it, weren't doing it. Basically what I did then because I was so upset with what was going on [was] I got the Chemical Manufacturers Association to run money through Duke University so that we could invite a group of scientists together who were really doing the work, to come

and sit in on these committees or these panels and help us. We did one on wildlife. We did one on the thyroid. We can go back, and I can pull them out.

But that money . . . and see, those scientists would not come to a meeting that the chemical manufacturers paid for. Then we set this up through the Duke, and Duke then ran it and organized it and helped us organize the meetings, and someone at EPA also helped manage it. But unfortunately they put a toxicologist at the top of each one of these things. I felt it was improper for me to attend because now I got it down to the point where we at least got the guys who were doing the research in the lab. It would have been, sort of, like I was cheating, and now I wish I had gone because I could have been there countering the poor people in EPA who didn't know. It isn't because they were trying to stop anything; they didn't have the knowledge. They were based in toxicology, and that's the only way they came from. So I did make a mistake, I know, by not sitting in on each one of those. But with that information that was fed back to our committees, the EDSTAC, they got us to where we are. So that was not done by that committee, and then the committee took it and did what they could with it.

ROBERTS: So in this case, unlike some of the other previous cases of interference, this is more a disciplinary problem than it was a non-profit, academic, industrial interference problem. This is more about scientific boundaries.

COLBORN: Yeah, it really was. The committee . . . if you'd say, [. . .] "Are these the people who are going to do it?" I couldn't have done it. You know, I knew there was one assay out there we could use and that was the MCF-7 assay because it had been around, everybody knew it. That was the traditional assay that you used to test for estrogenicity or antiestrogenicity. You know it was there. But this was really quite interesting. I was so pleased because the feedback . . . at least these guys had a chance to come in and sit and talk with each other on what we knew. That's when we began bringing in the new young people; Tom Zeller [Jr.] started going to those things. This is the kind of thing that began to grow, but that all ran through Duke. That's about where we are. But the CMA [Chemical Manufacturers Association] paid—it was mainly transportation—and we decided . . . so what I did was pick Kansas City, [Missouri], because it was central.

It was the cheapest place to fly anybody. There's always a plane into Kansas City. We began looking at airline costs, and we could keep the costs low. They could fly there, the hotels were cheap, the accommodations were cheap, and nobody had to fly too far. The guys from the East Coast, the West Coast, coming down from Canada, that sort of thing. [There was] a lot of nitty-gritty planning behind the scene. This was taking a lot of my time.

ROBERTS: How many of the original people from the Wingspread Conference participated in EDSTAC?

COLBORN: In subcommittees? I think . . . . I'd have to go back and look. Lou was not at the first meeting. Howard Burn went home after the meeting and said, "I have a young man that you have to have, that you have to work with. You need a spokesperson. You need to travel around with Lou Gillette and tell your story." This is what he said, and he said, "Lou has been wanting me to come down and do a sabbatical. I'm going now. We're going to start looking at alligator gonads." So Howard immediately after the Wingspread meeting went down to work with Lou. Then Lou got very much involved. Lou has been in on this practically from the beginning, except sitting through Wingspread. I would say quite a few. I'd have to go back and look.

ROBERTS: A pretty good overlap.

COLBORN: Some overlap, yes, from those who had actually been doing the work, so it was good.

ROBERTS: So two years pass. They don't meet their mandate.

COLBORN: No, no, no. We met our mandate and it was a battle, believe me. There was a lot of terminology in there, and it was a battle. Proctor & Gamble held out. George Daston held out because he wanted the adult male assay to be part of—and this is a DuPont study—to be part of the battery. We fought against it and fought against it. He said, "Well, then I will not agree." So I made the suggestion that we basically put it in the appendix. He agreed; then we got that in the appendix. There he was defending this adult male assay, but that made it, so we got through that. We met our deadline, and actually got it before a science advisory panel within just about two years of the date we were . . . our deadline was August 1988, and we made it.

ROBERTS: Nineteen ninety-eight.

COLBORN: But I was not happy with it. I know it wasn't good—very, very upset with it. Still, then they set up what's called the EDMVS Committee [the Endocrine Disruptor Methods Validation Subcommittee], where we moved forward. That was not an advisory committee. Those of us who stayed on wondering why are we staying on, we're wasting our time, we'd go and we'd sit and we'd hear this, making no progress. But going back to the very first EDSTAC in the very beginning—I think we were into about the sixth month—and there we were still arguing over the definition of an endocrine disrupter.

It looked like, again, Proctor & Gamble and a number of the corporations were going to pull out if we didn't have a definition. There was no reason to move forward, and that's when I went home that night because . . . and that meeting was in Baltimore, [Maryland], because I remember taking the train back to Washington, going to my apartment and pulling out three

endocrinology textbooks and looking up the definition of the endocrine system. Each one had a different definition. So I thought, well . . . and of course, the lawyers were sitting in, the corporate lawyers were sitting in on these EDSTAC meetings listening to everything that was said.

I began to realize, it's dawned on me that, okay, well, why do we describe it? I mean, why do we define it? Let's just do a description. So the next day when we went back, first thing I said [was], "Look, why don't we just adopt a description? Let's forget a definition." Of course, that relieved the lawyers considerably. No complaint there. If you look, we do not have a definition. We have a description of what endocrine disruption is in EDSTAC, believe it or not. That then let us more forward, but that was Proctor & Gamble right there at the very beginning. Interesting.

ROBERTS: How much has that continued to be an issue?

COLBORN: With . . .

ROBERTS: Having a definition or a description . . .

COLBORN: Well, basically, [. . .] once you define something, and it's in the law, it pretty much can't be changed. But I was able then to get my definition in because I wanted the population level included in there because we have population level effects. We can see the population level effects. But there are . . . it's so important, to me, to get that in, and it is these population level effects that are providing us now with the evidence that we have a problem. We still haven't gotten to the core of the problem, which is that period of fertilization to birth.

ROBERTS: So what would you have liked to have seen after that two years? After EDSTAC and the first two years?

COLBORN: Well . . .

ROBERTS: Because it doesn't go away. It just transforms.

COLBORN: Well, see, what I learned was that in anything that the federal agencies do, they have to have committees. They have to have every stakeholder available. You can't resolve problems when every stakeholder has to be involved because not every stakeholder understands the problem, although they want representation. So I decided what we needed [was] to move to

our committees where we have people who understand what is going on with absolutely no conflict of interest. What I came up with . . . and I had been calling for, as I said way back, this Manhattan Project and it began to materialize in my mind and I began working closely with Dr. Barry [L.] Johnson, who was an ex-Assistant Surgeon General, who thought it was a great idea. Let's take it away from government. Let's put it into the hands of an independent, international organization. We gave it a name—EDICOR—the Endocrine Disruptor International Cooperative Research Effort. It would be funded primarily by industry, but industry would have nothing to do. [. . .] We, sort of, modeled it after the Manhattan Project because it was government and industry and a couple of foundations, who basically in two years and ten months built the bomb.

In this instance we thought, okay. If we could get the money from the corporations, certainly the government would match and we could get governments to match. So the name of the game was now to work with industry and see if we could establish this thing. I have beautiful handouts, months and months spent on designing the structure of this particular organization and working with Proctor & Gamble. Then later on S. C. Johnson also moved in on the scene and said they would like to be what they called the—what would you call them— the initiators of the program, be part of it; it would be theirs to say that they were the first real shareholders in this major effort.

So we got to the point where we were meeting, talking about how we were going to plan, and it was up to the corporation—to those two corporations to get the other corporations to come. It would take about ten million [dollars] a year. We talked millions at that very first meeting that I talked about earlier where it would take a hundred million [dollars] of these to do this and do it right and year after year after year. It would be something that would be set up and then be carried on in perpetuity. As it turned out, we even set up and advertised a nationwide competition for a campus to apply to have this on their campus and received—I would say—well over a dozen applications and actually reduced it down to finally one. The day we went to that campus to celebrate the fact that they had won this thing, they were going to have it on their campus, our friends from industry walked in and said they couldn't raise the money.

MCDONNELL: When was this? What year was this?

COLBORN: You know it's in there . . . . I have to think. I can go back. Let me see. I'll have to think. Let me go back. I'll have to pull that out.

ROBERTS: So were there any international campuses that were part of the competition, since it was supposed to be international?

COLBORN: No, because we felt we had to start somewhere. Basically, this was all . . . this was money, I was using grant money. I mean, I poured a lot of money into this effort. We did a

lot of traveling. We visited the campuses. We did two site visits, and it was very interesting and got very competitive near the end. It was really very, very difficult. Then, all of a sudden, three things just blatantly turned out that we knew right where it had to go.

ROBERTS: What were those things?

COLBORN: Rather than . . . pardon me?

ROBERTS: What were those three things that happened that, kind of, narrowed it down to the one campus . . .

COLBORN: Oh okay. Well, the campus that offered . . . first of all, it provided us the most diverse and well-planned program that would include environmental, in other words, ecological . . . good field research, a good laboratory to match what was going on in the field, good laboratory research, excellent epidemiology. Already a lot of the good epidemiological, I mean, the good toxicological that we had, that we had basing this on, that was low dose research, basically came from this particular university. Also at that university, they had just built a new building and a new department, which gave us space. We had space in a new building that was there for us.

Then the most important thing of all was the fact that they have a foundation where you can give the money—the corporations could give the money to the foundation and 100 percent of that money would go to the research. On every other campus, they take 45, 50, or 55 percent and industry was using that as an argument, "We're not going to give money to campuses for that." So that solved the money problem. Every bit of the money that was poured into this would go into research. That's basically how we ended up doing it.

ROBERTS: Can you tell us what campus this was, or would you rather not?

COLBORN: I would rather not because of a lot of reasons.

ROBERTS: Was there fallout after?

COLBORN: They were shattered. Then the director from there and I then went to Japan because we had a company over there that was going to do it, until the corporations got to them.

ROBERTS: All right, so EDICOR takes a . . .

COLBORN: Takes a nosedive.

ROBERTS: Takes a nosedive. The funders pull out. But has there been the possibility for something like that [to] emerge since? Is there, you know—where do you go after that happens? You go to Japan. That doesn't happen . . .

COLBORN: That didn't happen.

ROBERTS: You come back to the US, and now what? So this is . . .

COLBORN: I go to Europe and try to encourage them to keep doing what they were doing over there. You know, not let . . . and they all admit, you know, well . . . the same way in Japan. [. . .] Japanese industries were very interested in doing this. So I flew over one time just to meet with them. Got there and here's this meeting in this little tiny room in a hotel in a basement of Japan, where before I'd been talking to these corporations in big places. There's one little man sitting there, and he said, "I represent now all of the corporations." The tradists of the chemical manufacturers started a CMA Japanese thing. We walked into CMA Japan, and he called the thing off. It's really crazy. But we got these trips anyway, but of course, at a lot of expense. We were paying for a lot of this.

What happened was [. . .] every time I go I get to meet with the ministers of the environment where I go and talk to these people, but also they're dealing with the pressure of, again, not having the people within the government with the knowledge to do this. Now basically what I'm trying to do is find, where is there a hot bed? Where is there something within the government? Right now within our government today, the only capacity that we have to do endocrine disruption research is at the NIEHS, that very limited small program down there, not the national tox [toxicology] program.

MCDONNELL: What does that stand for?

COLBORN: The NIEHS, the National Institute of Environmental Health Sciences. It's a very small division, and they have a program in reproductive health, basically endocrine disruption. That's what they're looking at. Then there's the NTP, that's the National Tox Program, but most of that work is done to assist and aid the regulatory agencies and everyone working within that division of the NIH [National Institute of Health]—these are both under the NIH—are basically toxicologists. They refused to give up good laboratory practices, the usual, traditional strains of

animals, various ways of dosing. There's just all these things we're running into where there are complications now.

ROBERTS: But the director of NIEHS is also the director of NTP.

COLBORN: That's right.

ROBERTS: So why is it that those two don't . . .

COLBORN: Because they they're set up under different . . .

ROBERTS: They have the same director but they don't seem to communicate . . .

COLBORN: Mandates and missions. They have certain things they do. They have certain things they do. The work that's done under the NIEHS is not for regulatory purposes. It's basically an extramural program to get people out in the field doing the kind of research that we need to know about reproduction, development, and that sort of thing. They were basically getting the money and then teasing the universities and the profs [professors] that are out there with proposals saying, "I need to know more about this particular stage of development of this particular element of the endocrine system. Would you mind throwing in a little [about] this chemical X or chemical Y or just tell us what you know about it now? Here's an RFA [Request for Application]."

Always the money, part of that money goes for—and they have to— hiring either undergrads, pre-docs, or postdocs. This is a training program that they have there that is ideal for this, exactly what we need. It's called the DERT, [. . .] the Distributed Education Research Training. Yeah. So that's totally on writing RFAs to get the answers to the questions they need.

ROBERTS: So one head but two very different missions.

COLBORN: Yeah. Again, government.

ROBERTS: Yes.

COLBORN: Missions.

ROBERTS: Yes.

MCDONNELL: Okay. So where are we now? Are we getting close to TEDX [The Endocrine Disruption Exchange] or is that still far in the future for you at this point?

COLBORN: [. . .] Well, basically before *Our Stolen Future* came out, my database began to expand dramatically. Again, you know, we needed all those wonderful old documents that I'd been storing over the years, and I'd always had a full-time person just searching and putting data in that system. Already now at World Wildlife Fund, I had taken up a lot of space, and we put all of that under security in the center of the building, up on the fourth floor where no one wanted an office. They all wanted offices where there were windows. That was always under lock and key.

ROBERTS: Why did that need to be under security?

COLBORN: Well from early on when people found out I had this, I had a couple of moles try to get a job with me. You'd be surprised where the moles came from first. They came from the Beltway Bandits. Those industries that thrive on writing government reports wanted access to our stuff. So one of the first ones who came in, I couldn't believe what happened. But basically, we hired him. Then he said, "If you don't mind, I'd like to start working at 6:00 a.m. in the morning." I said, "Well, I don't mind." You know, I like people to juggle it because fighting the metro . . . and I was always into work by 7:00 a.m.

So I got there and already the next morning he was into this very, very high security database. I asked him what he was doing. He said something to the effect that the price that I was paying him, he couldn't afford to handle one job. So they had sent him from one of the big . . . . I mean, you know what. None of this came out in the interviews.

ROBERTS: So he was very upfront with the fact that he was . . .

COLBORN: Well, I caught him. I mean, I said to him, "Why are you doing this? Who are you doing this for? What's going on?" I mean, I got tough; I was upset. So I fired him right there, but I think they got it. He had plenty of time to get that thing out of there and get it to them. But he had to leave. Then we had staff who we had to—we had a very difficult time firing, but they were—everyone wanted access to this thing. So we made it non-accessible. What happened was I began getting into the human health and human literature and it just began to grow. It was just

unbelievable how much there was, but it moved into . . . and I moved totally out of the wildlife stuff, practically, almost completely.

Although everybody has always linked me with the wildlife, and I can always remember one very bitter wildlife biologist who has always resented what I'd done. Always said, "Well, I don't know why the hell she's getting all the credit. All she knows about is zoology." Well, I don't. I went in there with a background in pharmacy. I mean, my underlying drive from the very beginning of everything I've done has been human health, but using the wildlife as a model, seeing it out there. I'll tell you quite frankly, I didn't read Rachel Carson's book until after I got to Washington. I didn't have time. From the time I went back to college, I read nothing but technical papers. So when I read her book, I could see what she had done, and that's why people began to say I looked like Rachel Carson. I didn't look like her and I can't write like her. I'll never be another Rachel Carson, believe me.

Anyway, so it was that sort of thing. It became a human health thing, which was far more divergent than what I was doing at World Wildlife Fund. It was getting more and more apparent that I really needed to do something. But I was so busy there was never time to really feel out where I needed to be to be more effective. Then I hurt my back out here and came out here to work for my eight weeks in the summer. When the doctor told me I couldn't go back, I mean, that made me do what I knew I should do, but my mind wouldn't let me do, but my body made me do.

Then the doctor said, "You can't go," so then I had to figure out how I would work from here. The big thing then was how do I get all of that here—those ten thousand pounds of files, those papers? Who is the world would want to come out here and live here? Well, as it turned out, two of my staff came out and looked the place over, and they didn't want to leave. I mean, just like me, and they're here. One of them now is still working for me; the other one is off doing wonderful work through Purdue [University] on NSF grants, following the work that he was doing for me out of World Wildlife Fund with wildlife and the environment. That's basically how TEDX started, but I had this grant money. I had grant money, and I also had this wonderful award that I got from the Japanese in 2000, which was about the equivalent of four hundred and fifty thousand dollars.

MCDONNELL: What was that award?

COLBORN: That was the Blue Planet Prize. That was when I found out how famous I was in Japan, really very funny. [laughter] Anyway, quite an experience and the Japanese are wonderful people. They treated me beautifully. So at that point, I knew I couldn't function without this. I had my staff still there gradually finding jobs and making sure this one got a job somewhere, that one got a job, got one off to work on her PhD. You know, "You've got to do this now, this is the time to go," getting them situated.

As it turned out, World Wildlife Fund did call and say that they were thinking of phasing out their toxics program. So with their blessings, I paid and had everything moved out here, and these two staff did all the boxing because all the papers had to be taken out of the filing cabinets so the filling cabinets could be moved. They covered everything for me in Washington and also the wonderful human resource people at World Wildlife Fund. Everything just went beautifully.

So we got it here and then I thought well, no one's going to know me, but at least I had that money behind me. I immediately applied for—registered as a non-profit and a corporation in Colorado. How it got its name is really interesting because finally I was to meet with a lawyer the next day to fill out the papers for incorporation. I found a lawyer who could do it, who does it for non-profits, by the way. I know I was going to have a name for it, and I didn't have a name. I was reading David McCullough's *John Adams* at that time.[22] I woke up in the middle of the night and said, "Oh my God. I don't have a name for this thing. What am I going to call it?" I reached over and grabbed *John Adams* and I went to—it was about page one hundred—and I began writing "the endocrine disruption," and I got to "T-E-D." I said, "Oh my God." Those were my maiden name initials, Theodora Emily Decker. "Wow. This is it." Then what do we do? T-E-D, you have to have more. We'll make it the "Exchange." We'll put an "X" on the end, T-E-D-X, and that's what I did.

So then I called Mike the next morning. I got up and Mike was always at work at six o'clock in Washington, Mike Smollen, who moved out here with his wife. I called Mike and he was already at work. I said to him . . . and this was . . . . I mean, I was up at 4:00 a.m. I knew I had to get this done. He said, "Give me half an hour. I need to do something." He called me back in a half an hour and he said, "We've got it." Nobody had it. There's nothing related to porn with it. He grabbed TEDX, Inc. org and net right then and there. He said, "We have it. We're on." So that's how it came about.

Then I thought afterwards, what a horrible name. There we go again with "endocrine disruption." These two words we've been struggling over, but I thought I just can't . . . what else can we do? I mean, basically that's what we do. Then we ran with it and then immediately applied for the 501(c)(3). As soon as I got the 501(c)(3), then I sent that back to World Wildlife Fund, and then they sent me the check so that I could operate here. Put Lynn on. Lynn was on full-time. Then we hired locally a young person to be the administrative assistant for three hours a day, five days a week.

MCDONNELL: So was there any reaction from people in this neighborhood when you first established or did they know what you were doing? Or . . .

COLBORN: Just close friends, and oh, yeah, people began to know. They related back to my work; remember, I was an activist here trying to pull together evidence about the woes of coal mining because in the mid-1970s they were going to sacrifice this valley. They didn't care what

[22] David McCullough, *John Adams* (New York: Simon & Schuster, 2001).

happened here; they needed the coal. We have a low-sulfur, high-BTU coal here. We had started a non-profit here based solely on . . . it was a research center to do research on the activities of coal, natural gas, you know, that sort of thing. It wasn't natural gas in those days. It was oil shale; we were very worried about oil shale.

The irony of all that is that the papers that I leaned on came from the Office of Technology Assessment.[23] Those were the papers that I used to make my argument that we have to protect this river. You saw the river. You see how much water comes down that river in the summer. Industry had bought up the water rights for 350,000 acre-feet of water, when that river . . . when only in a good year, 250,000 acre-feet come down. In the summer, its dewatered way upstream so that what you see in the river now is nothing more than runoff from septic tanks and municipal treatment plants. The river is, you know . . . because it's all diverted to the land to irrigate it to make it green and beautiful here.

ROBERTS: So you're back here now.

COLBORN: I'm back here now.

ROBERTS: And how did coming back here, very suddenly, give you an opportunity to rethink some of the projects that you wanted to do? That you didn't have to do under the auspices of World Wildlife anymore, you now had your own organization. It seems like TEDX incorporates both the "you" that was in Washington and the "you" pre-Washington. Can you maybe talk a little bit about the diversity of projects that comprises TEDX?

COLBORN: Well, it's crazy because that week that I broke my back, a corporation said they were going to come in here and drill this mesa just across the valley here—what is called the Grand Mesa. We live on a lower mesa below that, where I raised my family and where I got inspired to go back to college because I was so concerned about water. But that was very, very low on my radar screen in 2002, remained low on my radar screen really in 2002 until 2004.

But what I did in 2002 when I was flat on my back, and I couldn't move, but I could read and I could use a laptop [was] I sent back to Washington and said, "This is one of the chemicals I think they're going to use out here when they start fracturing." This is where you introduce a million gallons of fluid or more underground under very high pressure and with explosive events to basically crumble the zone in which you're working underground to release

[23] *Environmental Protection in the Federal Coal Leasing Program* (Washington, D. C.: U.S. Congress, Office of Technology Assessment, OTA-E-237, May 1984); Protecting the Nation Groundwater From Contamination (Washington, DC: U.S. Congress, Office of Technology Assessment, OTA-O-233, October 1984); Protecting the Nation's Groundwater From Contamination: Volume II (Washington, DC: U.S. Congress, Office of Technology Assessment, OTA-O-276, October 1984).

the gas, facilitate the release of the gas so that more gas can come back up the pipe. They sent me a FedEx box full of information on this chemical.

Then I read about the chemical and saw how bad it was, and at the concentration at which they were going to use it and understood that when you inject something underground it doesn't mix and it takes years and the water underground moves very slowly. It's like a river moving about the pace of peanut butter underground and things don't mix. All the people that I knew that lived around me had dropped a well, and we were all trying to get a little bit of this water that comes from the snow melt on the Grand Mesa that goes into the ground and then comes up in these little seeps and where the geology surfaces and brings the water to the surface. So I was very concerned about that.

So I wrote a letter, and I went back and looked at it the other day. I really . . . . I'm amazed what I poured into that thing, but I just took my experience from Washington because I knew if you don't get something on the record, it has no meaning at all. Here I was writing this thing about this and said, "Okay. I'll send it to the regional forester and the regional BLM [Bureau of Land Management] man who were issuing the permits to this company to drill on our forest land and to get into the natural gas that the BLM owns under the forest."

So I sent off that letter, and I thought I had done what I would do. Although more and more people were calling me and bringing me stuff, I still just . . . . I did nothing with it until 2004 and almost to the day. It was in September, I got a call from this woman from Garfield County, [Colorado], where all the natural gas has been taking place without any oversight, it's just been unbelievable what's been going on over there, to tell me that she had developed a rare adrenal tumor. She had read my article that had—or my memo, that was on the docket to the forest service.

When I heard adrenal, I thought, "Oh my gosh. This is endocrine disruption." I'm not kidding you, I was sitting in that chair by my back window, and I could just feel this thing come up my back, you know, the chills go up my spine. I thought, "I think I'm going to get involved in this. I mean, this is coming back at me." Of course, at that time we were just beginning to understand too, that practically every chemical that is an endocrine disrupting chemical was made from natural gas. This was all coming together. It was like, "Wow, unbelievable." So that's where we're sitting now.

But my work continued on. I was writing . . . the important thing was, and according to my board, keep writing technical papers. So if you go and look, I did a paper on everything we knew about pesticides and neurodevelopment.[24] I did one on reproductivity.[25] Those take a tremendous amount of time, if you look, they're full of lots of citations. I was still serving on committees, a lot of it by telephones. I was sitting on the committees in Canada for the

[24] T. Colborn**,** "A case for revisiting the safety of pesticides: A closer look at neurodevelopment," *Environmental Health Perspectives*, 114 (2006): 10-17.

[25] T. Colborn, LE. Carroll, "Pesticides, sexual development, reproduction, and fertility: Current perspective and future direction." *Human and Ecological Risk Assessment* 13 (2007): 1078-1110.

International Joint Commission. I would join by telephone, stayed on those panels and committees, served on a lot of things like that. I was doing lectures to campuses, sending out the PowerPoint lecture in advance so the professor could show it and I could read my text and then discuss with the class.

So we were getting this message out and all along, I kept telling Barry [L.] Johnson, who used to head OSHA [Occupational Safety and Health Administration], who left OSHA, went to . . . then he moved over to the ATSDR [Agency for Toxic Substances and Disease Registry], where he set up the ATSDR Program, where they are doing an excellent job in collecting data on chemicals; but they would not let him do what he wanted to do in the epidemiology, what needed to be done, so he quit. He then became a professor at Emory [University], and that's when I got him to come on my Board.

So I was sharing all this information with Barry about the health effects and what was going on out here with natural gas. We realized that ATSDR couldn't help, OSHA couldn't help. He said, "You have to make this a public health issue." That's when we began working more and more in natural gas, collecting as much data as we could, getting states and non-profit organizations who could get us the information of the materials, the names of the products that were being used to produce natural gas. So now we have the most comprehensive list in the country, filled in with health effects, the names of all the chemicals, and it's a resource now. When there's an accident now, people often call us first because there's no other place to go, to see if we know anything about the product that they're dealing with because no one has anywhere to go. I sort of built a team. Some of my old foundations found me, were willing to continue to support me, had faith in me. With that, I was then able to hire someone to work on natural gas. Unfortunately, I'm still working with people who are working about thirty hours a week, not the forty that we would like to have. As we get more money, we hope to bring more of them on.

In some instances some of these people could not possibly work the full week because they have children or they're caretakers at one end or the other with parents, husbands, or with their children. So we've got this typical problem, with societal problems where we don't have enough health care to take care of the people who need to be taken care of in their homes. We don't have any babysitting type of situations out here. You know, you have to find a babysitter, and she'll be a babysitter for a while and then she quits and you have to find another babysitter.

ROBERTS: Right.

COLBORN: But we're getting along. I found one woman who came in, who as everyone knows [. . .] it's like, wow. What's happening? Ed [Edward] Marston, who was editor of *the High Country News* for years, sort of went into semi-retirement, picked up an old building in town which was the old tractor repair place, the Harvester building. He remodeled it, and he was just getting ready to start renting offices. He had the perfect space for us; it was unbelievable and at a very reasonable rent. We had been looking about maybe setting my office up in

Washington, DC, and rentals out there would have just been prohibitive. Well, here we were able to get rent for five hundred dollars a month, that included everything, utilities, and . . .

ROBERTS: Wow.

COLBORN: Yeah, really neat. It was only half a block from my home. We found it just in time, so that when we got the stuff moved out of World Wildlife Fund, it arrived into that building. A great story. Three very big, tall, Black men, wonderful men, drove that truck from Washington, DC, out here, came over five mountain passes in a snowstorm.

ROBERTS: Oh my goodness.

COLBORN: They left Denver; [it] took them eight hours from Denver . . .

MCDONNELL: Oh my goodness.

COLBORN: They were so—they were in a state of shock by the time they came here, because you haven't been on that road yet.

ROBERTS: No.

COLBORN: Oh my. Gorgeous road, but treacherous and in a snowstorm they couldn't believe that we drive that and we do that every day. They unloaded that night because they had to turn around and head out; they had to go farther west. But none of them had been west of, say, Ohio. This was such an experience for them, but they got it all dumped into the building anyway. Yeah.

ROBERTS: Persistence.

COLBORN: Yeah, persistence, you know, you just hang in there. So as it turned out, we were writing papers. Lynn and I were doing all this, serving on committees, answering questions, dealing with the old endocrine disruptor crowd, staying very much involved. Also providing services because everybody was using our database, because they had . . . they couldn't get the papers like we had. So we were providing a service for campuses, for professors, I would not do

it for graduate students. I said, “You have to do your own research. We’re not going to do your research for you. You’ve got to learn how to access systems.”

I’ll tell you quite frankly—thanks to Health Canada and then when I went to World Wildlife Fund there was a woman there who basically ran their library—if I didn’t have a good library behind me, I wouldn’t be where I am. I had library services like you wouldn’t believe, and I do now because we’ve created it here and made it possible. But you have to be able to get into the literature. So I’ve long given that up because it’s so complex and it takes a logic, computer logic that I don’t even want to get involved in.

But I’ve got the people who have the brains and that’s when I found this woman [Carol Kwiatkowski] who actually had been a professor at the University of Colorado working in the medical department, a statistician doing a lot of work on behavior in health, how behavior contributes to health and moved here to raise her family, two small children, wanted to get away from it all. But suddenly after two years began to realize that there was something missing in her life. Where was this stimulation that she had got, and a couple of people had told her she should come talk to me. She walked in, and she came in here and sat down on the couch. She wasn’t here twenty minutes, and I knew she was the right person. She then came back up to the office and at that time I had a big hunk of butcher paper. You know what butcher paper is. It’s ten feet wide, and we had twenty feet long, tacked up on the wall. On that we marked it off in thirty-eight weeks, and this was fertilization and this was birth.

At that time, we were adding anything we could find, and it’s eight years of searching all the literature to find out where along this line, in these particular parts of the brain, in these parts of the female reproductive tract, the male reproductive tract, the bone, the thyroid, all of that—— where did we know these kinds of systems kicked in? When did they start developing? Quite frankly, we know nothing, and that’s why we need this inner-space research. What we have, it was up there, and it was all scribbled on and pretty sloppy, beginning to tear. When she walked in—she never did like it—but I let her start working on an issue that we had a problem here with, and they were having a problem with nationwide, with everybody in small communities being sprayed with pesticides, weekly, week-after-week in the summers. So she tackled that issue, and she has a segment on our website on what she did on the permethrins. It’ll be a very interesting thing for you to look at. Then she managed on her own—not on my time—to set up another non-profit for just dealing with political issues so that she could take campaign money.

She set up a campaign to educate people, using just educational materials that we were able to produce for our group and for groups across the country to use in their campaigns. We were able to get enough people reelected to our mosquito board for the first time ever who were not one of the old boys and they took over the board. Everybody is delighted in town because we’re not getting sprayed. We don’t have mosquitoes, you know. I mean, we’ve always had our share, a small amount, but nothing like what it . . . but she kept looking at that thing on the wall.

She came to me one day, and she said, “I understand now what you’re trying to do.” I said, “But we’ve got to get these thousands of papers that we have in the database up on that thing so we can show where the chemicals begin to hit it.” She said, “I think I can do it for you.”

It was translating it off the wall and out of the paper and into the computer, so that it was internet accessible. You know, we could do it for ourselves, but how did you make this internet accessible? She did it. If you go to our website, it's a beautiful website now. Then to protect ourselves we didn't dare use anybody else's pictures, except for one picture. We had to buy a picture of sperm. You will see that practically every picture in there we got ourselves, or we took ourselves. So you get a chance to see what western Colorado looks like. Then we, sort of, broke out into programs. With her managerial skills, I made her then an executive director because the important thing now for me is to be able to phase out and create something here that doesn't depend upon me.

So what I'm trying to do is bring in people [and] give them the skills and the training—so they can become the spokesperson, I don't even have to check on what they do and make sure they're doing it right—and build basically what we call a sustainable non-profit in Paonia, Colorado, that can be as effective as if it were anywhere in the world. That's my goal now. So I have an executive director who is fantastic. I mean, she has taken over. It's amazing what she has done; we just hired a new administrative staffer who is relieving her of a lot of her work and moving more into helping more with preparing for all of the legal things you have to do throughout the year. We're really structured. I'm so proud of my organization because I look at other non-profits, and I see why they fold because you have an active group for a while, they come in and they work, and they volunteer and they get things done, and then all of a sudden interest drops and there's nothing there. They go back to that organization for help, and they're not there to help. So I'm building, trying to build something that will go on without me.

MCDONNELL: What are some of the other organizational goals for the future, for the next few years, projects moving forward?

COLBORN: Well, basically you've probably seen . . . now we got the critical windows of development up which we think will lead us toward and help us work more toward convincing people that we need inner-space research. We have to build on that. To put a chemical on there, it takes about, I would say total full-time—I'm talking about full-time work—two people about three months because you have to search the literature; you've got to go through every one of those papers. Every one of those have got to be translated into and fit into the Word program that we have to put it into so that it then goes into the internet, and the tics pop up in the right place. You know, that all has to be done through the proper feeding of this into the computer. We want to add more chemicals to that list. That's a very big thing on our list.

We have a thing that we've been working on, and I was working on in Washington, and that's called "fetal origins of cancer." For every one of the major diseases, I have been collecting every piece of literature over the year on any evidence that say diabetes or thyroid problems could be initiated prenatally. A few years ago because of pressure by all the cancer groups and everyone's so focused on cancer, we produced the first fetal origins of cancer program, which is on the database. It was one of our very first things we put up, that you can get in there and you can fill up every one of those citations. We've searched the literature on that.

We need to go back; it's two years old now. And the goal of that was, of course, to make people think in terms of prevention, and it did. We clicked with the group in Canada who wanted to start a cancer prevention group, the first cancer prevention group. This was not a cancer cure or treatment group. So they used that as a basis for their cancer group in Canada and it's been very effective.

Now we want to start building on it, and we started listing the ones we're going to work on. We just had a retreat in here just two days ago going down the things we want to do. That was on our list, then also let me see. Fetal origins of cancer, fetal origins of disease. We still need to keep publishing technical papers. We've had such terrific feedback on that one little thing that got into *Scientific American* recently where I looked back and retrospectively looked at what EPA did and was very frank and used terminology that anybody could understand and just bluntly said EPA made a big mistake.[26] I've had now more people call, more people say, "We need more of that. Will you do some more?" So I'm going to try to do a little bit more of that, but that immediately gets into our website. We want to build the website more.

We also want to add on and make sure . . . right now, what we are doing is links because everyone wants to know what they can do to help themselves. So we want to improve our links thing, which we're hoping we can hire someone to come in and just sit. I would like to hire someone who knows nothing about this, who doesn't know about endocrine disruption and get that person out there. I can get a good scientist; even scientists don't know about this. You'd be surprised. Yeah, I haven't hired anybody that doesn't have a biology or a science background, but they don't know about this, and get that person to come in. Preferably, it'll be a woman with a family and let her now go through all our links and look for others because—I'll tell you quite frankly—every day of the week we're getting something from somebody here, somebody there, somebody new writing a book. It's reached the point where I can't read all their books. I can't endorse their books. There isn't time. But we feel that there is some really good constructive stuff out there.

The other thing we want to do is continue working with our big spreadsheet that encompasses all the product names, health effects. Now we're working with a New York City effort to fill in how these chemicals will migrate or move in the environment, looking at them from their stand-alone position. How would that chemical look if it were dropped on the floor there? Would it eat a hole in the floor? Would it stay there forever and not hurt anybody? Would it volatilize? You know, and could it get into the air? We're very concerned now and we want to emphasize more the air pollution problems that are associated with the gas industry energy development because it's been totally overlooked. But the big thing is that nowhere have there been comprehensive water monitoring programs set up to deal with monitoring before the development starts, and then being able to monitor, continue monitoring afterwards to look for changes in what's going on in those underground aquatic systems.

Also, the surface systems. Surface systems are extremely important in the West because that's what we live on. We don't have aquifers like you do in the East. So our big goal then now

[26] T. Colborn, "EPA's New Pesticide Testing is Outdated," *Scientific American,* April 27, 2009.

is to work on that to come up with a plan and design a kind of field kit that you can go out with or an easy monitoring program that goes beyond just testing for calcium and pH and chloride and toxic trace metals, which they still should consider doing. But adding maybe ten or fifteen more components that will pick up practically every one of these egregious chemicals that are being used—if they're being introduced into the system—and understanding the systems better. So if we see a shift in maybe a cation or anion that would not even have reached the point where it's of significant health effect, but it would indicate that ha, there's communication.

So that's now our big move in natural gas so that we will be available now for all the water conservancy districts across the country. You'd be surprised how many are just in Colorado alone, and we're constantly being called for help on that. The BLM needs this. The BLM is crying for something like this, and the BLM is not going to be able to do it. They don't have the money; they are not interested in that kind of thing. EPA's not going to do it. Again, we're trying to be at the cutting edge of what's happening. We always seem to be—I don't know why—for some reason or other, and we want to stay there.

MCDONNELL: Since TEDX has been in existence have people from Colorado, or from the West in general, responded? Or has it been more a national response?

COLBORN: Oh my God. You wouldn't . . . we're overwhelmed, totally overwhelmed. And, you know, everybody's talking about the Marcellus Shale as if it's new. Marcellus Shale people started getting a hold of us at least two years ago, two-and-a-half years ago. It was people who have second homes along the Delaware River in Pennsylvania who first picked up on this because they began to worry about their water. They're worried about the drainage, the whole drainage, the Delaware drainage, the Susquehanna drainage, you've got the Hudson River drainage. You know how much something up the river can affect downstream, the PCB [Polychlorinated Biphenyl] stories we've got there now. When you look at the chemicals that they're injecting underground, if there ever should suddenly be communication, there are chemicals in that water that yes, industry will tell you you'll find them in your cosmetics, but you don't want to drink those things every day. You do not want them in your water. This is one of the problems that if you go back to how we've addressed these chemicals, industry has always said it's low dose.

The cosmetic industry will argue, "My product is safe." And I will argue for them, "Yes, your product is safe, but the trouble is there are five hundred other chemical cosmetic products out there, maybe thousands more that have those same chemicals in it." I don't know of one woman who uses one cosmetic or just a cream rinse or just lipstick. They know now the average teenager is using something like twenty-seven—just things she puts on her face in a day. Every one of them have both chemicals in them. This is the big problem. It's applying to natural gas as well—the whole thing. We need full disclosure; we need disclosure of what is in products. So we're going to keep fighting for full disclosure. We'll be available to serve on panels. We will testify. We take pride in what we do. We send off now to legislators where we know this information will be helpful, and so we're wired into state and federal legislators, and we're

being called more and more by committee members and asked a lot of questions at the federal level.

I just testified a few weeks ago when I went to Washington for the . . . it just overlapped, it was beautiful, with endo—the Endocrinology Society meeting in Washington. They wanted me to testify the first day, so I had to miss the first morning of that meeting to go testify on the Hill about endocrine disruptors in the aquatic systems.

ROBERTS: You have a pretty ambitious project list for TEDX.

COLBORN: It's very ambitious, but I'm reinforced more and more by the number of people who have this gut feeling and the wisdom to know that as society moves forward, they're going to be far better off in an area where they can live off their own backyard. Those are the kind of people I'm trying to hire—these people with the gut feeling—who understand that we can't survive in cities under the systems that we're living under continually. It isn't going to continue to happen successfully without being dependent upon someone else. We bring people in. We run them through. It is amazing the women that I have interviewed and men as well who are very interested in this. Some are ready. Some are not.

ROBERTS: That's the second time you brought that up. You brought that up again yesterday. Is there something in particular about—what is the unsustainable element about urban life? Is it just the size? Is it . . . yesterday you also mentioned this sort of self-dependence characteristic of living out here and having one's own garden, having one's own self-sufficiency. Why is that such a crucial element for the types of people that you're trying to bring in to the fold of this project?

COLBORN: Well, you see, when we moved from the West to here . . . [train whistle blows] We'll let it go by, okay.

ROBERTS: It's just the 11:30 a.m. coal train, that's all.

COLBORN: Yeah. It's that late. Okay. It has to do one more. It's going to do it right here. It's going to blow us out of the window.

MCDONNELL: Really? I guess it was really long, wasn't it? The train.

COLBORN: Oh, the train's a mile long, over a mile. Well, he was kind.

ROBERTS: How about that?

COLBORN: How about that? Wait, you just heard him. The wind is blowing. We're going to hear him again. We have to. I hear him in two sequences. One as they're leaving. Amazing, he got through . . .

ROBERTS: He's already through . . .

COLBORN: Okay. He was a nice engineer. We need to find him and keep him more often. Anyway, so okay. Well, I guess what I found out was that most of the people who live out here are poor. They were poor people. They were land rich, but they owed . . . here, now he's [the train engineer] at the end of the town. They were land rich. They had a lot of land, but they could barely pay their bills. Working in the pharmacy, the pharmacy would let all the ranchers put everything on the books. Then in the fall when they sold the cattle, when they brought the animals down out of the mountains and shipped them off to Denver, that's when they got paid. They got paid once a year. It's really interesting. People didn't have the frills and things that we have now.

Then we moved into this economy where the coal miners began to make a lot more money, and we went off of unions. When we had unions, they used to go on strike every two or three years and fight for wage increases. So the coal miners who lived here knew they had to live in a budget. But then we went off the unions, and then the next thing you know these coal miners were out buying every toy, off the road vehicle, everything you could see. We call them "boys with toys," but they began getting themselves in debt, seriously.

There's so much poverty in the cities and if we could—those people who were living in a rural area where they could grow their own food, and provide their own shelter with the food—basically, I just worry about food, housing, and keeping people warm. It's getting harder and harder. We have more and more people in this country who can't afford to buy food. It's become very serious.

Living here, I see people who have very little money, but they're healthy, and they're raising their own food. They're living within the bounds of what they can afford. No one buys any new clothes here. Everything you see on me, I have bought in the secondhand store, the thrift shops. This is where we buy our clothes. I think there's another way to live and until we . . . and those are the kind of people that I appreciate that work on it with us. We were talking about that, you know, it isn't a culture I thought I was going to build within my organization, but my staff brought it up. We have a culture among us, and we looked around. Now there are six of us now, working there.

They all agreed that it is just a comfortable way to work. It is so much fun to come to work. We know that things are bad, but we know that we can exist, we can survive under what we have here. They're all learning, you know, they share seed, [say] "Well, this is the way I make my cheese. How do you make your cheese?" I mean, this sort of thing. We decided we, kind of, liked that culture, that it would set an example for what we think is sustainability that will come from the organization within. That only just happened two days ago. It's amazing.

But we have . . . our Board did say we have to come up with a plan for transition and we're in transition now. They were very pleased when I hired an executive director. My vision is that in five years, I will be a senior fellow emeritus spending more time birding and doing crossword puzzles—two crossword puzzles a day—and we'll have a president. I would hope to see a new president within just a few years. We get a new president in there, then . . . and of course, we were talking about maybe it's time now to start trying to entice some of these people who are retiring from government who get it to come out here and live.

ROBERTS: So that's . . . . I have just a handful of questions and you're playing off of a few of them. The one is, how has knowing what you've learned over the last twenty to thirty years of this research changed the way that you live? So how have you internalized it and made it personal? I think you've already started to talk about that a little bit because it's gotten you thinking about other types of ways in which society might exist. You're trying to live that, but at the same time, I can't help but think about how difficult it is to get to Paonia. If you've got to leave, how much I have to do to get out of Paonia.

So there's a balance between being removed and being perhaps too removed, especially when you still have to exist and your research is demanded in other parts of the country and other parts of the state and other parts of the world. You as a person are in demand across these different places, so how do we strike that balance and at the same time—I'm trying to make this into one question, but I realize there's two pieces . . .

COLBORN: You sound like one of my Board members. [laughter]

ROBERTS: Well, that's not such a bad thing. So there is, I mean . . . . I like the idea that you're trying to show that this is more than just about fixing a regulation; this is really about fixing a lifestyle. I like the idea that you're also internalizing and personalizing what you've learned. So I don't know if you can talk a little bit about how you feel like your life has changed, that the everyday practice of your life has changed over the last twenty or thirty years doing this sort of work.

COLBORN: See, my problem is [that] I was a product of the Depression.

ROBERTS: Why is that a problem?

COLBORN: What?

ROBERTS: Why is that a problem?

COLBORN: Because I'm a skinflint, a cheapskate. I want everything the cheapest way I can get it.

ROBERTS: But if you want it the way—the cheapest things—if you wanted things the cheapest way you could get them, you would use a lot of the products that you see as problematic and so is that true? Or . . .

COLBORN: Well, no, but here's the other thing. I was raised where we could only afford what we needed. I was raised on getting by on what I needed, not what I wanted. I never got what I wanted for Christmas. For Christmas I got the things I needed, you know, like warm winter underwear. I wanted a bike, I wanted roller skates or something like that. But so I've lived that way and that's part of me.

I get very upset when I see the junk people are buying. So when people always ask me, "What do we do?" The first thing I say is, "Don't buy anything you want. Right now, cut it off. If everybody cut off what they wanted and only bought what they needed, we would get this problem turned around. We would begin to solve the problem almost immediately." Because so much of the products that we don't need but we buy are full of the chemicals that we are trying to tell you about that are bad chemicals. That's what I try to talk about to my staff. It's interesting because most of them say, "Well, I've been doing this for years."

That's how I find these people. I mean, I didn't select them on their personal . . . . I don't ask them whether they're married. I don't dare, you know. I don't ask them about their families when I'm trying to hire them. So you put them through the "Where did you go to college? Who did you talk to? Oh, you knew that professor. Oh, great." I'm finding people now who actually worked with some people who actually made them read the book, which is great. Those are the kind of people that are migrating towards us and applying for our positions when we're advertising.

I think that's a big part of it. Encumbrances—get rid of your encumbrances, and that is basically what I did when I went back to college. I mean, I gave up all . . . . I had a big twenty-four-room house in New Jersey—a gorgeous house, beautiful furniture, nice stuff. Always had a fur coat, you know, I came from that era where oh boy, I graduated from college, the first thing I'm going to do is get a job and buy myself a fur coat.

I went through that. I know what people are going through. I just hope we can get them through that stage faster than what I went through. But moving to the farm was quite an experience and it really was, but I loved every minute of it because I can remember my mother making our bread. You know, making our own specialties, our own noodles, and those kinds of things which no one even knows how to do today. People do not know how to cook. We raised all our own food, and of course, my children were all born with Celiac disease, which is what I had. So very early on they had no sugar, flour, starch, or milk in their diet until we got them to about seven or eight years old. We were really eating the right food. My father being in the food business, making sure we always had real food, and then with the children it was real food, no candy, none of the things that came packaged, anything like that. So they all eat that way. They are all very healthy.

As they say it . . . and actually I find, if I could just convince you young people, if you went out and bought only the food around the edge of a grocery store and not the stuff in the middle, and you prepared your meals from the beginning to the end of the week, you could live a lot cheaper than going out and buying . . . . I'm horrified at the price people are paying for a box of cereal, a loaf of bread. I mean, this is outrageous, and what they buy when they dash out to buy a quick lunch in one of these places and what's going into a pizza anymore unless you go to an organic pizza place, I mean, you're buying junk. The price they're paying for it, and it isn't even real food.

It's this whole thing again of . . . . I was really surprised that you even brought this up, but they brought it up at our staff meeting and especially Carol, our executive director, who is really taken a leadership in how we have to perceive ourselves, in our office, how we work. Oh my God. They don't waste a piece of paper; we use both sides. We try to do everything right; we just get mad every time we have to use an ink cartridge. We need this; we're so dependent upon this.

But about getting around. That's no real problem because I'm going to do DVDs now. We'll be sending out DVDs of our major lectures, talks. We will be . . . we're on the internet. I can do lectures by telephone. Very few campuses are ready to do a video. I was surprised; we thought we'd get equipped here. Then we found out . . . even Fred said, "Don't bother. We don't do it on this campus. We can't afford that kind of stuff." There are only a few elegant campuses that have that kind of equipment. So we will stick to, I think, the telephone—just pray these systems don't go down. This is where everything could die. We will count on the internet; we're going to count on DVDs and rapid DVD distribution, and we found out we can make them very cheap. We seem to have some donors who really want to just pour money into making DVDs. So I'm really not worried about it.

[. . .] Look at the people who are just stuck on the Hill in Washington, what they're doing from there and right now, the major corporations basically have . . . the big ones are running these drill rigs and this fracking equipment from thousands of miles away because when they're drilling the bore and it goes down through the ground, there's something sending back to the headquarters, and they've got geologists right there telling them every kind of strata they're

going through, every foot they know. They know there's a lot of pressure underground or where there's not much pressure from a different zone. They've got that all marked. Then when they decide they're going to drill, they know exactly when to change the bit. They know where they're going to go, they know what they're going to hit when they start going down through with the pipes. They will know when they need to put this thing to frack, that into frack. This comes at a different stage. It's all done from thousands of miles away with maybe two men in a hog house operating the computers.

So don't tell me we're not going to be effective sitting in Paonia because it was difficult for you to get here. I mean, you could have flown into Montrose, [Colorado], and it would have been fifty miles instead of seventy miles. But we take . . . you know what we use? We use that trip as our trip to go to the big supermarkets to get the things we haven't gotten in the past. Pick up what you can't get. Go to the bookstores. Get into the bookstores. Go to Home Depot and Office Depot and pick up those things we can't get here. We do it all at the same time, so you get your plane in, you get in in the middle of the day, there's another one that comes in at 3:40 p.m. That still gives you plenty of time to do all that. Then you don't have to leave the valley again for another six weeks. So no.

ROBERTS: Well, you've thought it out pretty well.

COLBORN: Did I tell them that? Go talk to Elise Miller. To get where she lives, you have to get on a boat.

MCDONNELL: Oh.

ROBERTS: Where does . . .

COLBORN: She's up in Puget Sound, [Washington]. She's out on an island in Puget Sound. They have her running [. . .] Commonweal from there. Nowhere near what's going on down in—what is it—San Luis Obispo, [California]. So yeah.

ROBERTS: Which itself is pretty remote.

COLBORN: I'm sorry. I didn't mean to get . . .

ROBERTS: No, no. It's great.

COLBORN: I didn't mean to get defensive and start . . .

ROBERTS: No, you're . . . it's not defensive. I think it's important to have thought through those things. I think it's . . . for some people if you're younger and you're encountering these things, you're potentially—you're wondering how to change your life. I think the interesting part about getting your perspective is that so much of this has been about your previous experience that you've brought into the research.

COLBORN: Yeah.

ROBERTS: Which then keeps playing in and I think you have a different trajectory than many other people out there who are coming at it at a different point in their lives and aren't children of the Depression. They're children of the children of the Depression. It's not about the consistency; it's about getting to do something totally different. That's good to hear.

The other piece that's tied to that that I also think is tied to this generational piece, and it's not on your crib sheet—these are things that I thought about at the end that I wanted to make sure that we covered. We talked a little bit about the topic of science, politics, and activism yesterday, and I wonder if you can just make a few comments about the role of those three playing off of one another and how you see it different from your generation versus the generation of scientists now. When we talked about it yesterday it was in terms of the 1960s and 1970s when we were talking about the Ehrlichs and the Commoners, talking about professional organizations like the AAAS and that there was a peaceful coexistence of science and politics and activism and that seems to have gone away. I wonder how you think about that relationship now, and what that's done to the ability of scientists to get up and say things off the cuff, but also to feel like they can talk more knowledgeably about the end of where their research might go.

The science/politics thing is so complicated now that I don't see people finding a good way to grapple with it. I'm wondering if part of the way to grapple with it for the future is actually to start thinking about the way that it more peacefully coexisted in the 1960s and 1970s. Since you've had your career thought those decades, I wonder if you have any thoughts.

COLBORN: Through the 1960s and 1970s, you thought it was peacefully coexistent?

ROBERTS: Well, I think that might be overstating it. I think you have examples of people who were allowed to do it, and it didn't ruin their careers. Ehrlich's career clearly didn't end. Barry Commoner's career didn't end although it was under significant pressure and he shifted from a couple of different places. But it seemed as though, and maybe I'm wrong—you can

correct this—but that it was okay for a scientist to talk about the political implications of their research. So you can have a very open and public debate about nuclear fallout. You could have a very open and public debate about chemical exposures. That doesn't really seem to be the case now. Maybe I'm wrong. But if I am wrong, can you tell me? If I'm right, can you maybe talk about what changed?

COLBORN: Well, see this is the problem. We're talking science, but for some reason or other, pressure from industry and this is, sort of, like a . . . it seems to be written into an unethical law within the federal government and the agencies especially that every stakeholder has to have a voice. But when you're talking about science, you've got stakeholders that don't know anything about what's going on. I think you have to begin to draw the line.

That has been this problem of, yeah, we're a democracy, and everybody should have a voice, but there are times when you don't bring in the guy down the street, who can only shovel coal, to do brain surgery. Basically, that's what we're doing now. We're trying to . . . and so anybody can come in with these brilliant people who know the problem and understand the problem and can come in and be a part of that and raise all kinds of questions. It's diversionary, and it's very easy. It's slick and it's easy to do. You know, as I said, one person in a group can destroy the productivity of that group and they'll never reach their goal. It's through diversionary side things, well, let's through in just this little bit of doubt. It's in seeding things with doubt and then also questioning the integrity of the person who's doing the work.

ROBERTS: So it's really a question about the role of expertise inside of a democracy.

COLBORN: That's right. I know people don't want to go to a doctor who doesn't know what he's doing that hasn't had the training to do what he does. They let someone like that make a decision about their health and yet we're thinking of health in terms of the global population, the total population. We still think we have to bring in somebody who is a victim, who knows nothing about the chemical that possibly could have made them sick and sit in on a panel where these very technical decisions have to be made. I mean, this doesn't sound nice, it doesn't sound like I'm very kind, but this happens and it happens all the time. A corporation that's making a product that we're trying to talk about is allowed to sit in on this discussion.

ROBERTS: [. . .] I don't think it doesn't sound kind, but I think it's a discussion about what are the different roles that people can play. One of the ways that . . . you're right that in the last couple of decades, at least, one of the ways to democratize things has been to just get everybody into the same room.

COLBORN: Yeah.

ROBERTS: A different way of thinking about it might be, what are the different roles that people can play in addition to that room? So part of the problem has been that that room is the final point.

COLBORN: That's right.

ROBERTS: So all the decisions are made there, but if not all the decisions are made there, then there's an opportunity for those voices to be heard in different places. I think your career, in terms of what you've done with this work, shows those different roles. You've been the scientist working in a lab, a scientist working at a non-profit foundation, a scientist working as an activist with workers or with groups that have environmental concerns, but also popularizer, and I want to talk to you a little bit about popularizing science, and what you think the role of popularizers could be or should be or should not be? Can you think of other examples of people—there are lots of people who are doing this sort of work, but maybe not enough. Pete's obviously very excited about the media and their role that they can play, but I wonder about the role also for some of the popularizers. So through our discussions I was thinking of Nancy Nichols' most recent book on, you know, growing up on the shores of Lake Michigan.[27] I'm thinking of Sandra Steingraber's work in trying to translate this immense amount of data into a medium where the average person can—whatever the average person is, if such a person exists—can pick up this book and learn something about this very complex topic.[28]

COLBORN: One of my visions or goals in talking to my staff is that maybe in a year or two we will be deeply involved in the production of a movie, a fiction movie based on science about endocrine disruption. I've been working real hard on that and I just can't . . . . I can get right to the point where I can even generate the money but I can't get a producer who wants to pick it up and use it. We've been working on scenarios. There's all kinds of things you can do so that people begin to understand what endocrine disruption is. They see it in a movie—nothing like a good movie. So that's one of the things that I'd hoped for and as I told you, I thought I'd almost made it. That was still non-fiction, but if we . . . but the name of the game was they were supposed to move on and basically work on it. Anyway, so we were supposed to get a movie, but they're so hung up on the follow-up.

Here's one of the big problems too: there have been a lot of good documentaries made, but what people have found is that they think it's expensive just getting the money to do the documentary. What they don't realize is to get that documentary promoted . . . you wouldn't believe what a woman just went through. She's just done a beautiful documentary on natural gas. She thought she had it made, and then she found out she couldn't get it shown anywhere

[27] Nancy Nichols, *Lake Effect: Two Sisters and a Town's Toxic Legacy* (Washington D.C.: Island Press, 2008).
[28] S. Steingraber, *Living Downstream: An Ecologist Looks at Cancer and the Environment* (New York: Addison-Wesley Publishing Company, Inc., 1997).

unless she had about thirty-five thousand dollars to pay to get it into the film festivals. You've got to buy your way into the film festivals. So we made it. There's going to be this movie on natural gas, it's going to be released in—I'll tell you where, I'll make sure you take it and you get to see it.[29] So the grand opening . . . but I'm not going to fly to either of the major cities to be there, you know, just to fly to be there for the grand opening. Then they go to another city. I just don't think it's worth it.

But she's getting . . . a lot of the victims are going to be there with her. But what it took was pennies. She just wrote around to everybody and said, "Will anybody throw in some money?" She's raised apparently about twenty-five of the thirty-five thousand she needed and she's gambling that she'll get the rest. But that's . . .

ROBERTS: So there's a big role for popularization is I think what you're saying.

COLBORN: Pardon me?

ROBERTS: There's a big role for popularization . . .

COLBORN: Oh, definitely, definitely. I'm thoroughly convinced of it. The Europeans actually tried a comic book. Have you seen the comic book that came out of Europe?

MCDONNELL: No.

COLBORN: Oh God. I have to show you at the office. Maybe I can find it when we get up there. I mean, it was so bad, it wasn't the kind . . . well of course, I don't look at comic books today. It might be the kind of thing that would sell. But we need columnists who will do endocrine disruption, you know. A cartoon, maybe a cartoon like they have every week.

ROBERTS: It might be a pretty depressing cartoon.

COLBORN: Pardon me?

ROBERTS: It might be a very depressing cartoon.

[29] Science History Institute staff were unable to verify with the interviewee about the name of the movie.

COLBORN: It could be, but well, look at some of them. Aren't they? People follow them every day.

ROBERTS: I don't know. I don't read too many cartoons either.

COLBORN: Well, I'm not a cartoon person, but cartoons sell. Yeah. No, definitely, it must be popularized. That's why . . . but I did, I was told that I popularized in that little thing when I attacked EPA. I took the popular approach, I used words—there wasn't a word in there that someone said they didn't understand. That's what I need to go back and do.

ROBERTS: This was the *Scientific American* article?[30]

COLBORN: That *Scientific American* thing, you know. The EPA failed miserably. They didn't do this, you know, and now I'm going to do the same thing. I'm going to talk about that rat uterine cytosol assay.

ROBERTS: Right.

COLBORN: Then I want to take on this thing that Kavlock just released, got published.[31] He sent it to me last winter, so proud of it and wanted to know if I would comment. I said, "Bob, no way. I'm not going to give you a comment on this." He wanted me to endorse it.

MCDONNELL: What was it?

COLBORN: It just came out. It's basically, what they did . . . they decided they would get into all of the literature, any literature that was related to toxic chemicals. They would pull this all together and from that then they could begin to prioritize the chemicals we really need to look for. The NRC, the Natural Resource Council panel, reviewed it and said it would take another twenty years before it was ever finished and it's totally useless. It's just another priority, but that was Daston's dream and Kavlock did it.

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[30] Colborn, "EPA's New Pesticide Testing is Outdated," 2009.

[31] K. Houck and R. Kavlock, "Understanding mechanisms of toxicity: Insights from drug discovery research," *Toxicology and Applied Pharmacology* 227, no. 2 (2008): 163-178.

ROBERTS: Well, in some ways, I mean, prioritization at times doesn't seem like such a bad idea when you're talking about eighty to hundred thousand chemicals and you can't figure out where to start. It would seem that you would need to have a beginning. So I guess . . .

COLBORN: Well, you do . . .

ROBERTS: I know, I guess I don't . . .

COLBORN: That I agree with . . .

ROBERTS: Totally understand . . .

COLBORN: And that's easy to do, tonnage. You go out and get the tonnage. Get the production use, and then also . . .

ROBERTS: So use the high production volumes . . .

COLBORN: I mean, that you have to do. Anybody with common sense would do that in the beginning. Then you get it down to, okay, well, where is this stuff going? You know, oh, it's in my home. Oh, it's in the automobiles. It's in the airplanes. But you have to prioritize where it ends up and that should not be too difficult, but it is for the purchasers of the products that are coming into our homes. There we finally reach the . . . where the rubber hits the road, and Wal-Mart wants to know and the companies are not telling them.

So we're right back at . . . so then also they're not putting it on the label. These well-known egregious chemicals, if they're in a product, should be on the label. Where do you reach the point where we know enough that you put it on the label? Of course, what the smart companies are doing is saying, "There's none of this; we've tested our product for this." Well, I guess they've been caught. They said there was none in it, and then I guess Environmental Working Group and [Richard] Dick Smith in Canada went up and tested some products and found that there was a lot of it in the product, probably coming from the cap or because of something they put in the bottle. The point is that . . . but for the government to be spending this time and money on something like that, millions [of dollars].

ROBERTS: So where does the future go? That's the last question. What's the future of . . . you know, you've written some rather scathing takes on EDSTAC recently, especially now that it's finally had some new life breathed back into it. Where's the future of the field? What's the

future of it inside of government, for the masses, etc.? Where do you . . . . I don't know if it's both, where is it going, and where would you like it to go?

COLBORN: Well, if we're not smart enough to use the resources that we have already at the NIEHS and put those people to work, along with their tentacles—they know where the people are that are doing this kind of research around the country. They [need to] let them get their RFAs out, so we begin to educate people in this field how to handle tissues, and believe me, there'll be such a reduction in the use of animals when this effort starts because it doesn't take a lot of animals to pick up endocrine disruption because it's across the board in every animal. This isn't anything that takes eight thousand rats to look for weight of organs. That isn't going to work. I think it will happen, but only with this ability and also their ability to reach out and find those hot beds of scientists that are in the other countries.

Now, if you'll look right now, in the United States, there was such a cutback on the funding of the kind of research that we need done, that some of the top scientists in our country are now working with scientists in other countries. Of course, none of these are going to be a single-person report. I mean, this requires multidisciplinary work to get the work done and do it right because you've got to have your chemists to demonstrate what chemical is involved, and where it is, and how it moves through the system. You have to have your endocrinologists, your developmental biologists, people who are very specifically trained in one particular stage of development of that particular tissue. This is what we need.

Well, if you look now . . . and it's mind-boggling when I finally got in and saw what my staff had done and what they had put into our critical windows of development for Bisphenol A. It was maybe one US scientist and a [long] list of scientists from another country using the money from the National Institutes of Health from European countries or Scandinavian countries or the UK [United Kingdom]. So they now are collaborating with these people overseas. Ana keeps an apartment in France because she's collaborating with so many people in Europe, because she can't get the work to do here, or the money here now.

Because, again, we have to weed out our review panels and what they call study groups where you sit in a study group and you review a study because there's so many proposals being submitted that even if you get one panel member on a review panel against you, you're out. You're removed from competition. What we need are people on panels who recuse themselves, if they want to be on, they recuse themselves when it's something to do with a corporation they've worked for that had something to do with. This has to happen or we're not going to make a breakthrough. Again, it's going back to and allowing the scientists with the intelligence and the training to be able to do the work.

ROBERTS: All right. Do you think there's anything else we should have asked you?

COLBORN: No. I think we asked a lot. I think I told you a lot more than I would actually have revealed. Whew. Let me see. We have to empower physiologists. Yeah. We have to empower a lot of people. You know, we want to reach the kids on campuses. Okay, but see, the role of TEDX through all of this is to package the information so that the non-profits and the support groups and the NGOs have the information to carry out their campaigns, not just based on anecdotal information. That's what we've tried to do. We've also tried to provide and package the information so that other scientists, the scientists now, you wouldn't believe the number of scientists who have contacted us and thanked us for Critical Windows.

Then when they got in and saw some of the other stuff we had in there, they said, "We had no idea you were such a resource. You have saved me weeks of preparing." Someone called and said, "You just saved me a week of preparing my lectures for the year." So we're getting this feedback from people on campuses who are using the information so that they can educate, they can maybe get involved in policy.

That's our role, and every now and then I have to remind my staff, this is our role. We're not going to do that, you know, we're not going to endorse this product. We get calls every day, "Will you come on my radio station?" As much as I would like to and reach a lot of people, if they're endorsing a product we're not going on. It's really keeping ourselves isolated. So we must maintain our integrity while we're doing all of this.

Let me see. You asked me what it meant when I got all the awards. Every time I got it, I said, "Why me? This is ridiculous." But I appreciated every one of them because it may have allowed me to keep endocrine disruption alive. I always said that I open every one of my talks, "Look, there's a battery of people behind me. But I thank you for this opportunity because now I can tell you." Then I get a chance to dump it on them. You know, we've got this pandemic of disorders. Males are especially at risk. You know, I can do my talk, and so I reach a lot of people.

But there are very few press at any of these places where I get an award. So we're basically . . . . I'm speaking to the choir. We're trying to avoid speaking to the choir as much as possible. So that was why it was such an opportunity to go speak to the American Chemical Society last summer in DC.

ROBERTS: That's right.

COLBORN: Were you there?

ROBERTS: I was.

COLBORN: You were there for that lecture.

ROBERTS: I saw the ACS [American Chemical Society] and the . . .

COLBORN: The Male Predicament.[32]

ROBERTS: Talk you gave to the Green Chemistry and Engineering. It was the same trip. You did the Green Chemistry and Engineering Conference. . .

COLBORN: Yes, first.

ROBERTS: Then you came back for the Legend Symposium.

COLBORN: I never should have done that. That was . . . did you see what they did to my DVD?

ROBERTS: No.

COLBORN: Oh. It's a disgrace. I had counted on . . . the only reason I did it was because I thought I could get a good DVD out of it. Oh . . .

ROBERTS: This was the Green Chemistry and Engineering Conference?

COLBORN: No, [at] the Green Chemistry and Engineering Conference, they didn't film.

ROBERTS: No.

COLBORN: No. But I thought that went so well.

[32] T. Colborn, "The Male Predicament," Keynote Address at the 12th Annual Green Chemistry and Engineering Conference, June 24-26, 2008.

ROBERTS: It did. It went beautifully, and it was wonderful to see what it did to the younger folks in the room.

COLBORN: Really?

ROBERTS: Yes.

COLBORN: Okay. Because you know who I still want to find, I'm trying to find the man who got up almost at the beginning, and he said he had a grandchild. It was as if he was . . . everybody knew him. He had on a suit. I mean, he was definitely a corporate man. He talked as if everybody should have known who he was because he said, "You know, I have this grandchild that has ADHD." He said, "I am appalled. I am totally appalled because we took that child everywhere. We talked to a lot of doctors, and not one doctor considered prenatal exposure."

I wanted to reach him. I wanted to get back to him because that was quite a testimony as far as I was concerned. Then that other woman got up—the young woman—and she really spoke but you know what came out of that? Someone came up at the end, all these people crowded around, and this very strange man came up again. He looked granola, and he was working his way through and he got to me in line and he finally said, "I want to give you money." I said, "You do?" He said, "Yes. I want to give you money." He said, "I want you to get this message out." He said, "I am an engineer. I've been in the energy business all my life and I never knew this. I didn't know anything about this. Everything I heard you say was new." So guess what. He ends up to be a multimillionaire in a very, very wealthy family in Boston. He's been waiting for the DVD to show to his family, so he could get his family to give us money. He immediately sent us fifteen thousand dollars for a DVD.

See, so you never know where you're going to get money. But you know what I loved about that . . . because I got up real early because I always go test the platform, I always go test the lighting, the microphone, and I got up real early to go to do it because they wouldn't let me in the night before. They were already having their meeting. I couldn't do it. I walked up to that platform cold because if I didn't have that platform to stand on, I couldn't have stood there through the whole talk. I mean, this is how bad it was. It was just the right height. The light was perfect. I could just see a few faces, I found my energy in the audience, and I don't think I flubbed on one word in that talk. That thought . . . when I had it, I got it from the beginning. So you see it was given to me that particular day. But I have to take you out and show you something funny.

ROBERTS: All right. Do you want to end . . .

COLBORN: Oh, are we on? Shall we end on this because I'm going to show you what was so funny . . .

ROBERTS: That'll be great. Yeah. So thank you so much for spending many, many hours with us.

COLBORN: Okay.

ROBERTS: And all right . . .

COLBORN: Okay. Now, let's go back . . .

[END OF AUDIO, FILE 2.1]

[END OF INTERVIEW]