

Regional Oral History Office
The Bancroft Library

University of California
Berkeley, California

Disability Rights and Independent Living Movement Oral History Project

Ralf Hotchkiss
INNOVATOR IN WHEELCHAIR DESIGN, DISABILITY ACTIVIST

Interviews conducted by
Sharon Bonney
in 2007

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Since 1954 the Regional Oral History Office has been interviewing leading participants in or well-placed witnesses to major events in the development of Northern California, the West, and the nation. Oral History is a method of collecting historical information through tape-recorded interviews between a narrator with firsthand knowledge of historically significant events and a well-informed interviewer, with the goal of preserving substantive additions to the historical record. The tape recording is transcribed, lightly edited for continuity and clarity, and reviewed by the interviewee. The corrected manuscript is bound with photographs and illustrative materials and placed in The Bancroft Library at the University of California, Berkeley, and in other research collections for scholarly use. Because it is primary material, oral history is not intended to present the final, verified, or complete narrative of events. It is a spoken account, offered by the interviewee in response to questioning, and as such it is reflective, partisan, deeply involved, and irreplaceable.

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Ralf Hotchkiss, left, training a wheelchair production team from the Republic of Georgia, a joint project of Whirlwind Wheelchair International, the World Institute on Disability, and Georgia's Coalition for Independent Living, 2010.

Photo by Beso Darchia, courtesy of the World Institute on Disability.

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[End of interview]

SERIES HISTORY by Ann Lage
Disability Rights and Independent Living Movement Oral History Project

Historical Framework

The latter half of the twentieth century witnessed a revolutionary shift in the worldview and legal status of people with disabilities. In major cities across the United States, people with disabilities began in the 1960s and 1970s to assert their rights to autonomy and self-determination and to reject the prejudices and practices that kept them stigmatized, isolated, and often confined to institutions or inaccessible homes under the care of family members.

Within a few years of each other, groups of people—usually young, often with a university connection, and frequently wheelchair users with significant physical disabilities—formed organizations in Berkeley, New York, Boston, Denver, St. Louis, Houston and elsewhere to foster independent living in the community and to advocate for laws and policies to remove barriers to autonomy. Characterizing these groups, which formed relatively independently of each other, was the evolution of a new core set of beliefs that gave a distinctive character to this emerging disability rights and independent living movement. Their members came to insist on self-determination and control over their organizations. They resolved to make changes in their own lives and in society. And as they engaged in political actions, they began to recognize the shared experience of discrimination and oppression among groups with diverse disabilities.

Very quickly, informal regional and national networks of activists developed, often including people with a range of disabilities, who shared information about the nuts and bolts of funding, peer counseling, and service delivery. They joined together to advocate for essential personal assistance services and for the removal of architectural and transportation barriers. These networks were formalized in national organizations, such as the American Coalition of Citizens with Disabilities (founded in 1975), and national gatherings, such as the 1977 White House Conference on Handicapped Individuals, which served in turn as catalysts for national and grassroots organizing on a cross-disability basis.

From the beginning, the movement was a part of the activist and countercultural climate of the times, evolving within the context of civil rights demonstrations, antiwar protests, and the emerging women's and gay rights movements. Early leaders such as Judith Heumann, Fred Fay, Ed Roberts, Lex Frieden, and a host of others conceptualized their issues as a political movement, a struggle for the civil rights of people with disabilities. A wide-ranging group of activists absorbed this civil rights consciousness and cross-disability awareness during a series of defining political actions, such as the nationwide sit-ins and demonstrations in 1977, organized to demand the issuance of regulations for section 504 of the Rehabilitation Act, and during the subsequent peer trainings on the rights of people with disabilities, which were carried out nationwide.

As the political movement grew, the new cadre of activists made connections with the emerging parents' movement and its efforts to free people with developmental disabilities from the massive and dehumanizing state institutions of the time. A series of landmark federal lawsuits, most notably *PARC v. Pennsylvania* (1972) and *Mills v. Board of Education* (1972), established

for the first time a right to a public school education for children with disabilities. Alliances and coalitions also developed with a number of traditional, disability-specific organizations, which were themselves undergoing changes during this period.

New organizations devoted to pursuing legal and legislative reforms, such as the Disability Rights Education and Defense Fund (1979), ADAPT, a grassroots direct-action organization (1983), and a growing number of other local, state, and national disability organizations and alliances profoundly influenced national policy in education, transportation, employment, and social services. Their best known legislative victory was the passage of the Americans with Disabilities Act in 1990, which, although compromised by subsequent court decisions, offered broad civil rights protection for disabled Americans and has served as a beacon for the creation of disability rights legislation in fifty other countries.

Less concrete than the legislative accomplishments and legal cases, and still evolving, is the shift in attitudes and consciousness that was driven by, and has transformed the lives of, people with a wide variety of physical and mental disabilities, challenging the notion of disability as stigma and instead embracing disability as a normal facet of human diversity. Theoreticians and artists with disabilities play a prominent role in defining and communicating concepts of disability community and disability culture, and academicians are promoting disability as a category of cultural and historical analysis.

These achievements, as significant as they are, have not ended the discrimination or the prejudice. Indeed, the first years of the twenty-first century have seen several Supreme Court decisions which have limited the expected scope and effectiveness of disability rights law, and many disabled Americans remain economically and socially marginalized. While the need for change continues, the tremendous accomplishments of the disability rights and independent living movement cannot be denied. American society has been profoundly transformed, and any accurate account of the social and political landscape of the late twentieth century will acknowledge the contributions of disability rights and independent living activists.

Project Design, Interviewees

The Disability Rights and Independent Living Movement Project at the Regional Oral History Office, the Bancroft Library, UC Berkeley, preserves, through oral history interviews, the firsthand accounts of the activists who have made significant contributions to the origins and achievements of this movement. The Bancroft Library also collects, preserves, and provides access to the papers of organizations and individuals who have been a part of the struggles for disability rights and independent living. All of the oral history texts, finding aids to the archival records, and selections from the archival papers and images are available on the Internet, as part of the Online Archive of California, California Digital Library.

The first phase of the project, completed in 2000, documented the movement during its formative years in Berkeley, California. Berkeley was the site where the concept of independent living was most clearly articulated and institutional models developed, originally by and for students on the Berkeley campus and soon after in the community, with the founding of the nation's first independent living center in 1972. These organizations and their dynamic leaders, together with the activist tradition in the Bay Area and a disability-friendly climate, made Berkeley an

important center of the disability movement and a natural focus for Phase I of the project.

During Phase I, Regional Oral History Office interviewers recorded forty-six oral histories with Berkeley leaders, many of whom have also been figures on the national scene. The Bancroft Library collected personal papers of interviewees and others in the disability community and archival records of key disability organizations, such as the Center for Independent Living, the World Institute on Disability, the Disability Rights Education and Defense Fund, and the Center for Accessible Technology.

Phase II of the Disability Rights and Independent Living Movement Project (2000-2004) expanded the oral history research and the collection of archival material to document the growth of the movement nationwide. The project again focused on those leaders whose activism began in the 1960s and 1970s. The forty-seven Phase II interviewees include founders and organizers of disability rights groups and early independent living centers in New York, Boston, Chicago, Texas, and California. Of these, many have also been national leaders in the movement and founders of national organizations who helped to conceptualize disability rights as a political movement and shaped the programs and philosophy of independent living. Others have been key figures in the development of disability rights law and policy, as organizers, strategists, and lobbyists behind the scenes. The project's ongoing Phase III has continued interviews with the founding generation, but incorporated leaders whose involvement began in the 1980s and 1990s.

A number of interviewees have held positions in state and federal government agencies and commissions, helping formulate government law and policy on transportation access, social security and health benefits, and personal assistance, education, and rehabilitation services. Several have worked to free disabled people from institutions, and others reflect on their own experiences living in institutions. Some interviewees were deeply involved with the parents' movement.

The international disability movement is represented by Yoshihiko Kawauchi, a leading proponent of universal design and disability rights in Japan; many American activists interviewed for the project also have connections to the international movement. Two interviewees are pioneering artists with disabilities, who discuss their careers as artists and the relationship of art and advocacy. Several have taught disability studies at colleges and universities, contributing to the concept of disability as a category of analysis analogous in many ways to class, race, gender, and sexual orientation.

Interview Themes and Topics

An overarching research goal for phases I and II of the Disability Rights and Independent Living Movement Project was to explore and document how a broad group of people with disabilities, in key cities across the country, initiated and built this social movement, and how it evolved nationally, within the context of the social and political fabric of the times. Lines of inquiry include social/economic/political backgrounds of interviewees and family attitudes toward disability; experiences with medical and rehabilitation professionals and with educational systems; identity issues and personal life experiences; involvement in civil rights or other social movements of the era; and developing consciousness of disability as a civil rights issue.

Interviews record how people with disabilities built effective organizations, with information about leadership, organizational structure and style, organizational turning points, stumbling blocks, achievements, and failures. Challenges particular to the disability community are addressed; for example, leaders of independent living centers point out the difficulties of providing much-needed services to clients and answering to government funding agencies for their service mandate, while still maintaining the essential advocacy roots of the independent living movement.

Interviews explore the building of national alliances and coalitions, investigating networking among groups from different locales and among groups accustomed to aligning on the basis of a single disability. Indeed, the issue of inclusiveness within the movement—the nature and meaning, and sometimes tenuousness, of cross-disability alliances and the inclusion of newly recognized disabilities—is a complex and significant theme in many project interviews, and offers an area for future oral history research.

Interviews document the range of efforts—from protest demonstrations, to legislative lobbying, to litigation in state and federal courts—to influence disability law and policy, to embed disability rights into the canon of civil rights, and to alter and expand the very definition of disability. Several interviews also reflect on a recent philosophical shift of some movement thinkers, who draw on a human rights framework and acknowledge the disability community's need for social supports along with equality of opportunity and civil rights.

Also examined by many narrators are race, gender, and sexual identity issues: the role of women (large) and minorities (limited) in the movement; the development of programs for women and girls with disabilities; questions of sexuality and disability; and the disability movement's relationship over the years with the women's, gay and lesbian, and African American civil rights movements. The involvement of able-bodied advocates, including parents of children with disabilities, is examined by many interviewees, both disabled and able-bodied, with telling accounts of often awkward and sometimes painful struggle over their place in the movement. (For instance, one organization toyed with the idea of granting able-bodied members only three-fifths of a vote.)

Another important theme running through these interviews is the question of equal access. This includes the impact of technological advances—from motorized wheelchairs in the early days of the movement to adaptive computer technologies more recently, all of which have profoundly extended opportunities for people with disabilities. And it includes the campaigns, legislation, and lobbying—on campuses, in communities, and in Congress—for removal of architectural barriers to people with disabilities, for access to public transportation, and for access to personal assistance services, all essential requirements for independent living.

Many interviewees reflect on the process of developing a disability identity and a sense of belonging to a disability community. Several explore the concept of disability culture and its expression in the arts and in media, and theoretical explorations of disability by scholars and educators. Interviewees who have pioneered the fields of disability scholarship, arts, and ethics point out the contributions of disability studies to the broader society in fostering new and more complex ways of thinking about the body, about normality, about crucial ethical issues relating to abortion, euthanasia, and physician-assisted suicide; and in contributing a unique disability

perspective to scholarship in history, literature, and cultural studies.

Project Staff and Advisors

Since its inception the project has been collaborative, with staff members and advisors drawn from the disability community, from academia, and from the Bancroft Library and its Regional Oral History Office. The national advisory board for Phase II includes disability rights leaders Fred Fay, from Boston, and Lex Frieden, from Houston; scholars Frederick Collignon and Sue Schweik from UC Berkeley, Paul Longmore, historian from San Francisco State University, and Karen Hirsch, disability scholar from St. Louis.

Ann Lage directed the project for the Regional Oral History Office, providing years of experience in oral history and leadership for the interviewing team. Interviewers for the project had a unique set of qualifications, combining historical perspective, training and experience in oral history methods, personal experience with disability, and, frequently, activism and participation in disability organizations. Oral history interviews were conducted by Sharon Bonney, former director of the Disabled Students' Program at UC Berkeley and former assistant director of the World Institute on Disability; Mary Lou Breslin, cofounder and former president of the Disability Rights Education and Defense Fund, policy consultant and lecturer on disability civil rights topics, and Henry Betts Award winner; Kathy Cowan, librarian for a public interest law firm; Esther Ehrlich, oral history interviewer and editor in the areas of disability arts and community history; Denise Sherer Jacobson, writer and educator on disability issues; and David Landes, former coordinator of student affairs for the Computer Technologies Program. Susan O'Hara, former director of the Disabled Students' Program at UC Berkeley and the initiator of the original idea for this project, served as consulting historian, occasional interviewer, and convenor of monthly project meetings.

Fred Pelka joined the interview team in 2000 and conducted major interviews primarily in the East. Pelka is a writer specializing in disability rights politics and history, author of *The ABC-CLIO Companion to the Disability Rights Movement*, and a recipient of a 2004 Guggenheim Fellowship for his proposed book, "An Oral History of the Disability Rights Movement." Harilyn Rousso, educator and consultant on issues of women and girls with disabilities, and Laura Hershey, writer and disability activist, also contributed interviews to the project.

Oral History and the Oral History Process

Oral history provides unique and irreplaceable sources for historical study. It preserves the reflections and perspectives of those who have participated in historical events, documenting with firsthand accounts how events happened, how decisions were made, and the behind-the-scenes interplay that underlies the public face of an organization or social movement. Beyond documenting what happened and how, the words of participants reveal the personal and social contexts and the institutional and political constraints which profoundly shape events but may not be apparent in the written record. Most significantly for this project, oral histories offer an opportunity to elicit reflections on often elusive matters of identity, changes in perception and consciousness, and the personal experience of living with a disability. Finally, they provide a record of how people remember and understand their past, often an indication of personal values and cultural meanings.

The DRILM project team all contributed to the design of the project and assisted in developing interview protocols. Once narrators were selected and arrangements made, they prepared a preliminary outline before each interview session, based on interview protocols, background research in relevant papers, consultation with the interviewee's colleagues, and mutual planning with the interviewee. The length of each oral history varied according to the length and complexity of the narrator's involvement in the movement, but also was dictated by scheduling and availability limitations.

Tapes were transcribed verbatim and lightly edited for accuracy of transcription and clarity. During their review of the transcripts, interviewees were asked to clarify unclear passages and to give additional information when needed, but to preserve the transcript as much as possible as a faithful record of the interview session. Interviewees were offered the opportunity to seal sensitive portions of their transcripts, or omit them from the Internet versions. Many of the oral histories are supplemented by a videotaped interview session. Video and audiotapes are available at the Bancroft Library. The project Web site (<http://bancroft.berkeley.edu/collections/drilm/>) links to the full-text of most of the completed oral histories, with video and audio clips, and to related projects on Artists with Disabilities and the self-advocacy movement.

The Regional Oral History Office was established in 1954 to augment through tape-recorded memoirs the Library's materials on the history of California and the West. The office is under the direction of Richard Cándida Smith and the administrative direction of Charles B. Faulhaber, James D. Hart Director of The Bancroft Library, University of California, Berkeley. Regional Oral History Office interviews can be accessed at <http://bancroft.berkeley.edu/ROHO/>. Print volumes can be read in the Bancroft Library and at the University of California, Los Angeles, Department of Special Collections.

The Bancroft Library's Disability Rights and Independent Living Movement Project was funded by field-initiated research grants in 1996 and 2000 from the National Institute on Disability and Rehabilitation Research [NIDRR], Office of Special Education and Rehabilitative Services, U.S. Department of Education. Additional interviews, focusing on antecedents, implementation, and impact of the Americans with Disabilities Act, were completed for the project under a 2006 contract funded by DBTAC-Pacific ADA. Any of the views expressed in the oral history interviews or accompanying materials are not endorsed by the sponsoring agencies.

Thanks are due to other donors to this effort over the years: Dr. Henry Bruyn, June A. Cheit, Claire Louise Englander, Raymond Lifchez, Judith Stronach, the Prytanean Society, and the Sol Waxman and Tina P. Waxman Family Foundation. Special thanks go to Professor Raymond Lifchez for his generous donation in 2006 in honor of Susan O'Hara.

Ann Lage, Project Director
Regional Oral History Office

Interview History—Ralf Hotchkiss

Ralf Hotchkiss has been called the “technical genius” of the disability rights movement for his innovative designs of wheelchairs tailored to the needs of the wheelchair rider. His work has taken him to over forty countries in Asia, Africa, and Latin America, where he has established wheelchair design and repair shops owned and managed by local people with disabilities and built with materials (mostly bicycle parts) easily obtainable in that country. These wheelchairs are built to withstand the topography of the region and cheap enough that people with disabilities can afford to purchase a chair or get their chair repaired. His philosophy is to make it possible for every person in a developing country who needs a wheelchair to get one that will meet their specific needs and lead to personal independence and integration into society. His pioneering work has advanced disability rights internationally and was recognized in 1993 when he was awarded the MacArthur Foundation “genius award” fellowship.

Hotchkiss was born in 1947 and lived in the Rockford, Illinois area. In his oral history he reveals that even before his spinal cord injury, he displayed an interest in disability and design; at the age of 15, he designed electronic devices which he hoped would be an improvement over the white cane used by people with visual impairments. This early experience taught him the importance of working with the consumer, a cornerstone of his work today. His spinal cord injury occurred in 1966 in a motorcycle accident after his first year at Oberlin College. After unsatisfactory rehabilitation experiences in hospitals, he returned home for a year before going to work in an engineering company. Soon he was applying his engineering skills to customizing his own wheelchairs.

In the early 1970s, after a move to Washington DC, where he worked for the Disability Rights Center, Hotchkiss was instrumental in the class-action lawsuit against the Everest and Jennings wheelchair company, which had a near-monopoly on wheelchair production and distribution. Through his efforts, Everest and Jennings was investigated by the US Department of Justice, and the company began to lose its monopoly power. As a result, wheelchair design improved as smaller wheelchair companies sprang up and prices of chairs started to decline.

In 1980 Hotchkiss took his first trip to Managua, Nicaragua, where he helped foster the independent living movement in Nicaragua and began designing a wheelchair called the “Torbellino,” the Spanish word for whirlwind. This Whirlwind design and the process of teaching local disabled people the skills to build wheelchairs and procuring locally available materials became the hallmark of his subsequent work.

The Wheeled Mobility Center at San Francisco State University, later to be named Whirlwind Wheelchair International, was founded in 1989, with Hotchkiss as its technical director. The center teaches people how to build the most current model of the Whirlwind chair, and these people then go to developing countries and teach local people how to build the chairs. All of the designs and drawings for Whirlwind chairs are in the public domain so that anyone can access and use them.

The three interviews for this oral history were videotaped in the home of the interviewer in Emeryville, California, on May 10, 11, and 14, 2007. Hotchkiss was open, candid, humorous, and politic in his answers. At the end of the interview, Hotchkiss showed off the RoughRider

wheelchair, which is the current Whirlwind design and is now being used as the model throughout developing countries. After each interview, Hotchkiss, the interviewer, and the videographer shared lunch and pleasant commentary. He was sent the full transcript of the oral history interviews to review, but did not complete his review.

The oral history with Ralf Hitchcock was initiated as part of the Disability Rights and Independent Living Movement project with funding from DBTAC-Pacific ADA Center for interviews on the antecedents, implementation, and impact of the Americans with Disabilities Act. Interview transcripts are available for research in the Bancroft Library and in the UCLA Department of Special Collections. Videotapes of the interview sessions are available for viewing in the Bancroft Library. Transcripts of this oral history and others in the Disability Rights and Independent Living Movement series are on line at <http://bancroft.berkeley.edu/collections/driilm/>.

The Regional Oral History Office was established in 1954 to augment through tape-recorded memoirs the Bancroft Library's materials on the history of California and the West. The office is under the direction of Richard Cándida Smith and the administrative direction of Charles B. Faulhaber, The James D. Hart Director of the Bancroft Library, University of California, Berkeley. The catalogues of the Regional Oral History Office and most of the collection of oral histories can be accessed at <http://bancroft.berkeley.edu/ROHO>.

Sharon Bonney

Interviewer

September 2010

Interview 1: May 10, 2007

[Begin Audiofile 1]

Bonney: This is the Ralf Hotchkiss interview. It's May 10, 2007, and this is tape one. OK. Morning, Ralf.

01-00:00:33

Hotchkiss: Morning.

01-00:00:34

Bonney: I'm really glad that we're able to do this interview. We've been waiting a long time to do this. Let's just start out by talking about your early childhood, if that's OK.

01-00:00:46

Hotchkiss: OK.

01-00:00:47

Bonney: Tell me where you were born, who your parents were, what they did, brothers, sisters, that kind of thing. Just background.

01-00:00:56

Hotchkiss: Rockford, Illinois, 1947. Grew up in a rural area outside of town. My dad worked with and for my grandfather, who had started a little Maraschino cherry processing factory during the Depression. Grandpa was a violinist with no work, and the only way to get work was to make it. So they had a dozen employees, and they made cherries for ice cream and fruitcake. My mother taught piano at home, mostly, and played organ and conducted a choir at the Unitarian church in Rockford. So it was a fully employed house. We all tried to be quiet, all of us kids, during the piano lessons, and we didn't usually succeed. I had two sisters: one one year older, one two years younger, and then a brother seven years younger, and a sister 18 years younger. Of course the younger sister wasn't born until after I left for college. But I got a year off of college, and got to take care of her from one to two years.

01-00:02:43

Bonney: Why was that?

01-00:02:44

Hotchkiss: Because I became disabled—broke my back. Got a break from college. Mostly stayed home and did a factory job, and had a lot of time for my little sister—with my little sister.

01-00:02:58

Bonney: Good. Yeah. Were you musical?

01-00:03:01

Hotchkiss: Yes.

01-00:03:01
Bonney: What do you do? What do you play?

01-00:03:03
Hotchkiss: Play trumpet, French horn, timpani, mostly percussion.

01-00:03:10
Bonney: And were you in bands at school?

01-00:03:12
Hotchkiss: Yes. Lots of that kind of stuff. In a little pop band—whatever you call it—rock band, as well.

01-00:03:26
Bonney: As a teenager.

01-00:03:27
Hotchkiss: As a teenager. I went to Oberlin, as well, partly because of the music.

01-00:03:33
Bonney: Oh. Were you going to be a music major, or —

01-00:03:36
Hotchkiss: No, no, never. But just to be around it.

01-00:03:40
Bonney: Are your parents still living?

01-00:03:42
Hotchkiss: My mother is. She's now almost 83, and in amazing, perfect health. Dad died about 10 years ago: diabetes, and complications. He really died of a country diner that he would visit every lunchtime. That was our observation. Not even theory.

01-00:04:08
Bonney: Got you. A little too much fat in the hamburgers?

01-00:04:11
Hotchkiss: Yeah. A lot.

01-00:04:12
Bonney: That kind of stuff. Yeah. What high school did you go to?

01-00:04:17
Hotchkiss: Harlem High School. It was a public high school in a little, partly unincorporated, suburb of Rockford. An old kind of working-class suburb. A lot of people who had come from Gatlinburg, TN, who had then settled in this farmland and called it a town.

01-00:04:43
Bonney: My ancestors.

01-00:04:45
Hotchkiss: What?

01-00:04:45
Bonney: My ancestors. Now, you mentioned your disability. You went off to college before you became disabled? Is that right?

01-00:04:54
Hotchkiss: Yes. Yep.

01-00:04:55
Bonney: What year did you go to college?

01-00:04:58
Hotchkiss: '65.

01-00:05:00
Bonney: And it was Oberlin.

01-00:05:01
Hotchkiss: Oberlin. And finished one year there, then came back. It was during the summer that I flipped my motorcycle.

01-00:05:09
Bonney: Oh. And had —

01-00:05:14
Hotchkiss: Paraplegia. T4, now T2, because it's kind of ascending a bit. So right on the fence between para and quad, more or less.

01-00:05:25
Bonney: Yeah. Yeah. So what happened after your accident? Where did you rehab?

01-00:05:31
Hotchkiss: Went to Chicago, just two weeks after the accident, which was very good luck. I would have been much worse off if I had stayed in Rockford. They already had lost both of my heels to pressure sores, and a bunch of other complications were quickly on the way. But Chicago was a great place to go.

01-00:05:52
Bonney: Where did you go in Chicago?

01-00:05:53
Hotchkiss: Rehab Institute of Chicago. Henry Betts, who was just a kid then, he was my doctor. The Rehab Institute was a couple of floors of a warehouse at the time.

01-00:06:06
Bonney: Not even by the hospital, or...?

01-00:06:09
Hotchkiss: It was near—it was in the same neighborhood it is now. Ohio Street, north of the Loop. But it was a particularly good place, I think, because no private

rooms, and that meant I had three roommates, who all had spinal cord injuries. Various types. That was good for all of us. It had an elevator to the roof of the warehouse, which was our kind of hideaway. Good escape place, in the middle of downtown Chicago. Lot of peer support there, from previously rehabbed people coming back, and just visiting, and hanging out, and getting to know us. A lot of peer support. Also had a lot of peer support back in Rockford, knew John Schleicker—very, very high quad—who had been one of University of Illinois—well, he said he was their first quad, who forced his way in there, in the fifties.

01-00:07:34

Bonney: At Chicago circle? Or, no —

01-00:07:35

Hotchkiss: No, that's in Champaign-Urbana. He said that Tim Nugent—until the time he forced his way in—had managed to push away higher quads, that, if you couldn't live on your own without attendant help—without personal assistance—that he wasn't interested. Well, he forced it politically, and got in there, and kind of helped turn Nugent and company around.

01-00:08:08

Bonney: Now, this is after you were all at the Research Institute—Rehab Institute.

01-00:08:12

Hotchkiss: This was while I was there, and afterwards.

01-00:08:16

Bonney: And afterwards. OK. What kind of rehab did you go through? What was life like there?

01-00:08:23

Hotchkiss: It was very basic. There wasn't much out of the hospital rehab at all. But it was a medical fantasy of the sixties. They wanted me to walk. There I was, you know, high T-level, and so they made me some braces that went from the bottom of my feet to the top of my shoulders, that would lock me like a telephone pole, and I was supposed to lift myself up, and swing through, and smile. I insisted on wearing an old football helmet because I knew that my head speed would be pretty high when it hit the ground, and sure enough, it was a few times. I opted to leave rehab, after just two weeks of that, because it seemed like largely a waste of time. I continued to do it back in Rockford, and later on in Oberlin, until I was badly injured once doing it—slashed an arm with a Canadian crutch while falling. Yeah, a lot of stitches. Later, I kind of moved out of that. I'd still stand up once in a while on various kinds of equipment, but mostly to stretch out. I've learned since that even the claims about bone strength are probably not true. That—

01-00:10:08

Bonney: What do you mean?

01-00:10:09
Hotchkiss: — that standing up, they said, would strengthen your bones, by stressing them. You get, perhaps, ten times as much bone stress from spasticity as you get from standing. So people who have spasticity tend to have less calcium loss in their bones than people who stand.

01-00:10:39
Bonney: I had never heard that.

01-00:10:40
Hotchkiss: Wally Motloch.. Years and years of observations.

01-00:10:45
Bonney: So, you actually did go around walking, then? On crutches, and —

01-00:10:49
Hotchkiss: No, my range was 50 feet.

01-00:10:53
Bonney: Oh. [laughter]

01-00:10:53
Hotchkiss: And provided there were no door thresholds to cross, and no side slopes at all. Outside? Forget it. It was absolutely crazy.

01-00:11:04
Bonney: So you did it inside?

01-00:11:05
Hotchkiss: Indoors only.

01-00:11:06
Bonney: Indoors only.

01-00:11:07
Hotchkiss: Only perfectly flat floors.

01-00:11:09
Bonney: And when did you realize that that was really futile?

01-00:11:13
Hotchkiss: The second day I did it. Then it took me another week and a half to negotiate my departure from rehab.

01-00:11:24
Bonney: Oh. OK. So what kind of a facility did you go to when you went back to Rockford?

01-00:11:29
Hotchkiss: My parents' house.

01-00:11:30
Bonney: Oh, so you didn't go into a different rehab facility.

01-00:11:32
Hotchkiss: I went to an Easter Seals center a couple of mornings a week, to do brace walking, and whatever else. Mainly, there, I learned how to climb curbs. We made a plywood variable-height curb, started low and worked on up. Amazing, with a chair like the one that I had at the time, that it was possible to climb curbs and descend them. Not safely, but...

01-00:12:00
Bonney: Yeah. Are you talking a push chair?

01-00:12:03
Hotchkiss: Push chair. That's all I've ever had. I mean—well, no. That's not true. I've had P200's for fun. For hiking with the kids.

01-00:12:13
Bonney: OK. Let's back up a little bit. When you went off to college, what did you major in, that first year?

01-00:12:22
Hotchkiss: Physics.

01-00:12:24
Bonney: Was that going to be your major?

01-00:12:25
Hotchkiss: Yep.

01-00:12:26
Bonney: But you're not a physicist.

01-00:12:28
Hotchkiss: I never intended to be one—just wanted to learn all the science I could, to be an inventor.

01-00:12:35
Bonney: OK.

01-00:12:36
Hotchkiss: It's all been pretty useful, except for the last year and a half, which was nuclear.

01-00:12:42
Bonney: But you know about it.

01-00:12:43
Hotchkiss: I know about it.

01-00:12:44
Bonney: That's good. I read something about you, that when you were, I think, in high school, you developed some devices for blind students, who were —

01-00:12:58

Hotchkiss: Blind friends, not —

01-00:12:58

Bonney: Blind friends? Tell me about that. What were you doing?

01-00:13:03

Hotchkiss: So, I had a couple of blind friends, had had a little bit of exposure to other disabilities, too. I still remember very clearly riding in a fellow's lap down a steep hill in Beloit, Wisconsin at high speed. I must have been three or four. It's one of my earliest clear memories. And just think—it had to be an old Everest & Jennings hospital style, because I remember very clearly that it rattled like a train on broken tracks, and that I had high walls on both sides of me, as I sat down in this fellow's lap. My mother could probably tell exactly what year it was, because she remembers it well.

01-00:13:51

Bonney: Now, was that a family member? Or friend, who just —

01-00:13:54

Hotchkiss: Friend.

01-00:13:54

Bonney: A friend.

01-00:13:55

Hotchkiss: Yep. Somebody we met on the street in Wisconsin, where my mother had grown up, where my grandparents were teachers, at Beloit College. So, anyway, I had—my mother's piano tuner was a blind fellow, and I was always interested in the piano, the mechanisms, and so he taught me a lot about that, and in the process I learned a lot about how he got around. I remember once, he had a dog, and his dog was walking with him out of the church, having tuned a piano there, and he hit his head on a shutter, a window shutter, which was way up at the five foot plus height. I remember how mad he was at his dog. His dog was, you know, four feet down. But he told me a lot about cane echoes, and how you can hear the different pitches of the tapping sound, and that will tell you the distance of adjacent walls, and the sharpness will tell you what kind of material they are. Of course you can tell a lot about the ground, especially if you don't have a folding cane. Back then, at least, folding canes were rattley and loose, and he said that they were just a disaster for mobility. Convenient, perhaps, but they didn't make the right sounds, and they didn't give him the right hand sensation to warn him about ice, in particular, very well, or changes in the texture of the pavement.

One of his frustrations was that he moved fast, and when he was tapping along, he would sometimes sense a curb, but not quite be able to stop in time. He didn't use, perhaps, as long a cane as some people do, for his height. His came up only to his chest. I know other people have them up at head height, or more. If his tap before last was right at the edge of the curb, then his next

one—his cane would be three feet out the street, and there he would be tripping on the edge of the curb. He wanted to go faster. But he was always having to temper his speed because of that risk.

So a high school science project was trying to figure out a cane that would give him warning, whenever the tip passed a curb, even if it wasn't touching the ground. I did a lot of library research, found a slew of well-funded projects designing devices to do just that. Most of them ended up with a briefcase full of radio tubes, and big batteries—this is pre-transistor—and the conclusion of most of the studies was, "This works great, but we need another grant to further miniaturize it, and to begin transistorizing it. Then everybody will have one hanging on their belt, or something, with a wire going to their cane and all of it." So I figured out how to make one cheap and simple. Theirs would cost hundreds or thousands as well—the ones in the research studies—and so I made one out of a transistor radio, a little, pocket-sized, inexpensive transistor radio. Then they weren't inexpensive. But I bought just a few parts—just the speaker, and just a couple of transistors, and a little rechargeable battery.

The whole unit would clip on the tip of a cane—didn't weigh much, just a little inch and a quarter speaker. It would tick. And with the help of the piano tuner, I played with the sound of the tick a little bit—the wave form—so that it made good echoes, and he would use his cane like normal, but it would be, "tick tick tick tick tick" between taps, without touching the ground. If he went over the edge of a curb, it would go, "tick tick tick [deeper] tick tick tick." It would change pitch suddenly, because the reflected sound wave would be further from the incident sound wave coming from the speaker. And so a tick would be two sound waves far apart. It would have a lower pitch. He said, "Yes, it worked." Not necessarily good enough, or as good—a little easy to drown it out with truck noises.

01-00:19:42

Bonney:

But how old were you, when you did this?

01-00:19:44

Hotchkiss:

Oh, 15, maybe.

01-00:19:46

Bonney:

You were young. Yeah.

01-00:19:49

Hotchkiss:

Well, it was pretty simple electronics. Then did some other things—built into a pair of glasses, some things that were like very, very crude auto focus cameras. They would sense focus, and thus determine distance of whatever—it was like looking through a soda straw. It was a very narrow range of view, and if something you were looking at was far away, you would hear a little beep in your left ear. If it was very close, you'd hear it in your right ear. If it was ten feet away, you would hear it equal in both ears. And you'd just swing

your head, and you could sense some obstacles. Unfortunately, a shadow looked just like the real thing. It was all interesting, but not that practical. But I think the thing I learned most—two things I learned most from that. One was that unless I spent a lot, lot more time simulating blindness myself—and even going beyond that, maybe. I mean, maybe even that wasn't enough—I wouldn't come close to having the perception of uselessness that my blind friend had. Two, I learned that the press is wide open to sham devices, to research that's of little value. And they'll glorify it, and make it look wonderful.

01-00:21:30

Bonney:

Did you get press coverage of these things?

01-00:21:33

Hotchkiss:

I did. 1964, or so. Or five. Got lots of press coverage, hundreds of newspapers, just from a student science award TV show thing. So I had hundreds of letters to answer, explaining to them all that this wasn't ready, and who knows, and how.

01-00:22:01

Bonney:

So, you were getting letters from people with blindness?

01-00:22:02

Hotchkiss:

Yeah.

01-00:22:04

Bonney:

Oh. Wanting a device. Cool. So, is that why you sort of turned to engineering, eventually? Or what got you —

01-00:22:15

Hotchkiss:

Sure. Well, I intended to keep doing that, if I could, somehow. Blindness was my greatest interest, but all of it was interesting. Any kind of disability. Just seemed like an open area, where very little was happening, and lots needed to be done. There were a lot of ideas out there, among people with disabilities. I'd go to the, I think, American Federation of the Blind, or Council of the Blind, local meetings, and people would get talking about what they thought they might like to invent—all kinds of good ideas, ranging from kitchen utensils, to ways to catch children. [laughter] And it was just all very interesting.

01-00:23:09

Bonney:

Now, you were doing this as a high school person, or a college person?

01-00:23:13

Hotchkiss:

Yeah, as a high school kid.

01-00:23:15

Bonney:

High school kid. OK.

01-00:23:19

Hotchkiss:

I met a fellow at Oberlin, when I was visiting as a high school student—that's part of why I went to Oberlin, because he convinced me that it had good, open attitudes—open-minded attitudes. A blind fellow at Oberlin, who had one of these thousands of dollars distance-sensing devices that was the size of a briefcase, and had light emitters, and receptors, and would vibrate against his different fingers, according to the distance of what it saw through its equivalent of a soda straw. He was testing it for one of the funded researchers. This guy was no amateur in the field. He ran his own electronics repair business out of his college room. Did a lot of electronic work, and really knew what the problems and trade-offs were in the circuit design, and showed me that it was a cute toy, but not even close. Orders of magnitude away from being truly useful. Also, Oberlin had been a school with blind students going way back, before—like, back 100 years ago, something like that. He just convinced me that that was the place for me.

01-00:25:06

Bonney:

Now, when you went back home from rehab in Chicago, you said you were home for a year, or two years?

01-00:25:13

Hotchkiss:

One year.

01-00:25:14

Bonney:

One year. What did you do during that year?

01-00:25:16

Hotchkiss:

I worked in the factory where I had been for five years—five summers—earlier. It was an aerospace company, making controllers for jet planes, and other big equipment, like power dams. I was working in their research lab, in electronic and mechanical design of controllers for small airplanes, I was working on mostly, and also power dams.

01-00:25:49

Bonney:

OK. And so then you went back to Oberlin?

01-00:25:51

Hotchkiss:

Yep.

01-00:25:53

Bonney:

And you got an engineering degree?

01-00:25:55

Hotchkiss:

No, they didn't have any engineering. Just physics.

01-00:25:57

Bonney:

Physics. OK. And what year did you leave there?

01-00:26:06

Hotchkiss:

1970.

01-00:26:07
Bonney: OK.

01-00:26:09
Hotchkiss: Graduated one year late.

01-00:26:10
Bonney: OK. That was pretty good. One year. That's not bad.

01-00:26:16
Hotchkiss: I was only in rehab three and a half months, then. So three and a half months after the accident, I got liberated. That was very short for that time. Now it's kind of long, because they throw people out on their ears before they're hardly started.

01-00:26:36
Bonney: Right. So, when you got through Oberlin, what was your first job out of college?

01-00:26:41
Hotchkiss: Same factory. Well, I had worked a year as an engineer in the factory, during college—my year home, with my little sister—and then after school, I stayed there for almost another year, working in the same lab.

01-00:27:05
Bonney: And then where did you go?

01-00:27:07
Hotchkiss: Then went to Washington, to work with Nader.

01-00:27:11
Bonney: Ralph Nader?

01-00:27:12
Hotchkiss: Yep. I had been working with him since '68. Had taken a summer off of the factory job, and been a Nader's Raider, started the end of '68. Worked summer of '69. So, went back to work with him full time.

01-00:27:35
Bonney: Doing what?

01-00:27:36
Hotchkiss: Doing product safety work, and auto safety—working for Center for Auto Safety, Center for Concerned Engineering, and working on issues like exploding aerosol cans making ten foot fire balls if they were full of paint when they got thrown in the trash. Back then, because burning of trash was so much more common then, there were scores of bad injuries every year, mostly to kids, burning off their whole face. That sort of thing. Because they'd be too close to the burning trash when the aerosol bomb exploded. So, worked on looking for ways to vent them before they would explode. It turned out in that case—did a patent search, and there was a good solution going all the way

back to about 1950 that cost almost nothing, and that had been rejected by the industry. It's now being used on all—things like camping butane. Those all vent before they explode.

I worked on issues like mobile homes blowing away, burning up. Volkswagen Microbuses rolling over very, very frequently. Issues like those. It was all very interesting. And got to spend some miserable years in Washington during the Nixon era.

01-00:29:17

Bonney: What was that like?

01-00:29:18

Hotchkiss: Watergate. It was a little tense. It would be like being there today.

01-00:29:28

Bonney: What kind of things did you see? What was going on?

01-00:29:31

Hotchkiss: People disappearing. People who were working politically in opposition to the Administration getting in unrelated kind of trouble, like trouble with the IRS [Internal Revenue Service] or trouble with the police in general. Surveillance happening right in our neighborhood. It was just a very tense time.

01-00:30:16

Bonney: What were the surveillance people looking for? What kinds of —

01-00:30:20

Hotchkiss: How do I know? I just saw them out the window.

01-00:30:22

Bonney: Oh, you'd know them.

01-00:30:23

Hotchkiss: Yeah, they would tape record phone conversations of people around the neighborhood. It was a kind of a low rent neighborhood with a lot of students, and Nader's Raiders, and other politically active people living in it.

01-00:30:42

Bonney: Were you politically active in Washington?

01-00:30:43

Hotchkiss: I was a Nader's Raider.

01-00:30:45

Bonney: So what were you doing?

01-00:30:48

Hotchkiss: Working on, again, auto safety, and aerosol bombs, and most—I was working on things that were politically pretty innocuous. Not in direct opposition to

Nixon, for example. I wasn't working on anything military, or anything that would insult any of the boys who do that stuff.

01-00:31:12

Bonney: These people that were being all of a sudden investigated by the IRS or something—was that just hassling them, or —

01-00:31:20

Hotchkiss: Seemed to be disproportionately frequent. That and many other ways of being hassled.

01-00:31:27

Bonney: Would they leave? What would they do?

01-00:31:29

Hotchkiss: Some would leave. Some, very few, but some seemed to just disappear. Nobody could find them anymore. Very infrequent, but it was a fear. There were, yeah, there were plenty of crazy things that happened in those days. Kind of restricting the activities of people who were critical of the Administration.

01-00:32:10

Bonney: Now, at some point, you started working on a suit against Everest & Jennings Wheelchairs [E and J]. Was that part of the Nader program, too?

01-00:32:19

Hotchkiss: Yes, that started in 1973. Evan Kemp, who—we probably don't have a history of him, do we?

01-00:32:35

Bonney: No.

01-00:32:36

Hotchkiss: Too bad. Too late. Though Janine might give stories. He was an attorney for the Security Exchange Commission in the early seventies, and I was his wheelchair repairperson. He had an old Everest & Jennings that would break down regularly, a manual chair. And it seemed to always break late at night.

01-00:33:07

Bonney: So, he would call you to come fix his chair?

01-00:33:09

Hotchkiss: Yes. He didn't live many blocks away. It was easy. It was pretty common knowledge that—well, first we knew Everest & Jennings had a monopoly, and there hadn't been much progress in wheelchair design that anyone could remember. When I did patent searches, I found lots of progress in the 30's and 40's, but not much since then. Seemed to level off, and actually started sliding backwards, by some of the ways they had cheapened chairs in order to make them easier to make. The ones from the seventies weren't as good as the fifties, for strength. Even though they were basically the same chairs, they

were weaker. Front forks were failing consistently, for example. In my little repair shop, I had dozens of front forks hanging on the wall, and I would just re-weld them. Every little while, somebody else would come in with one or two of them that were on the verge of falling off. So, I would just swap them out a fork.

01-00:34:36

Bonney: So, you had a repair shop in Washington?

01-00:34:39

Hotchkiss: Yes.

01-00:34:40

Bonney: Where was it?

01-00:34:41

Hotchkiss: 17th and Q, right off Dupont Circle.

01-00:34:43

Bonney: So, it was a regular shop?

01-00:34:45

Hotchkiss: No.

01-00:34:45

Bonney: Oh.

01-00:34:46

Hotchkiss: It was a garage behind my neighbor's house, and it was open by telephone appointment only. It was just my friends, pretty much. They would slip me some cash sometimes, but sometimes not. It was not a way to make a living, but it was a way to learn a lot about wheelchairs, and, yeah, they were all friends.

Anyway, so, Evan Kemp. Oh, it was also common knowledge that E & J was selling chairs for a third of the price—a third of the American price—we knew prices were very high. The equivalent of over \$2,000 in today's money for the only chair we had to choose. The E & J Premier. We knew that we could buy that for a third of the price if we went to England. We knew it because people had done so—gone over, bought a chair, and rode it home, and got it for a third of the American price. But you couldn't send for one to England. They wouldn't ship it to you. People had tried that as well, who couldn't get over there. Evan told me that that was an illegal restriction of international trade, for the parent company to refuse to allow its subsidiaries to ship to anywhere in the world. E & J had Canadian, Mexican, English, and German subsidiaries at the time. They were clearly dumping—especially in England—at low-cost, in order to keep competition out of the U.S. In fact, they as much as bragged about that to their stock holders, in at least one of their annual reports that Evan showed me. He had all—he had the file.

01-00:36:51

Bonney:

So, he had been watching them.

01-00:36:53

Hotchkiss:

He had been watching them. Because it was an illegal restriction of international trade, and because it had been going on for a long time, and because the price differential was so huge, we arranged a little sting, where in '73, I went over to London, and visited the Everest & Jennings show room, their store, in London, and they had a sports model for sale in the U.S. for \$495—that's in '73 dollars—and the same chair was for sale in England for \$135. So, I went in and picked out that chair, and made an order for ten of them. And wrote them a check. They worked out the receipt. They were quite pleased; they had never sold so many. Then I asked them to please ship them to Washington DC, where our basketball team was. This is a fifty-pound sports model, by the way. [laughter] And they said, "Hm. Well, let me check about that." And the fellow disappeared into the back office, came back a little ashen-faced about ten minutes later, and said, "Well, I made a call, and I've been reminded that our parent company in Los Angeles does not allow us to ship to the Western Hemisphere, so I'm going to have to give you your check back." In one way, it was good, because the check would have bounced. But nevertheless, there it was—an admission of illegal activity.

So I came back, and had a discussion with Jack Anderson and Les Whitten, newspaper columnists. They wrote it up—just a little one-page story, but told the story very clearly, about the price differential, and the refusal to ship. The justice department [the United States Department of Justice] immediately opened an investigation of the anti-competitive activities, and they found out some really basic facts quickly, like that Everest & Jennings—since about 1950—had had an over 95 percent monopoly on the prescription market every single year, and that there was a likelihood that they had done a lot of other repressive—and in some cases illegal, in other cases just reprehensible—actions against small competitors in the U.S., crushing them.

But that investigation kind of plateaued, and nothing happened, for a long time. Then when [President Jimmy] Carter came in, Griffin Bell was attorney general. The issue came up in a public forum that Griffin Bell had with Ralph Nader. Debbie Kaplan was there. She asked—in the question and answer period—asked Griffin Bell what had happened to this investigation of anti-competitive activities, this anti-trust investigation. And Griffin Bell didn't know anything about it, and he was a little embarrassed because Debbie and Nader had made pretty strong pitches as to the importance of this issue, and he said he'd check into it immediately. Within a very short time, suit had been filed. This was in—probably '77 by then—and things moved forward very quickly. They took me in as an expert witness. I had the pleasure of a 16 hour interrogation by Everest & Jennings' attorneys.

01-00:41:44

Bonney:

What was that like? Was it the white light shining in your face? [laughter]
That kind of thing?

01-00:41:55

Hotchkiss:

Not quite. But no, it was a debate. It was interesting. I felt OK about it. It was a challenge, and we fought hard. In 1979, the suit was settled. It was a classic consent decree, in which Everest & Jennings swore they had never done anything wrong, and promised never to do it again. Within a very short time after that, we had dozens of new wheelchair manufacturers. Quality had gone way up, wheelchair weights were as little as half what E & J had been—at least for non-folding models, and a third less for the folding models. Bearing life was much, much longer. Common breakdowns much less frequent, and prices were half what they had been in real dollars for similar chairs. Even E & J's prices eventually dropped to half what they had been, or less. So that was a success.

There's been some slippage since then, as Invacare and Sunrise Medical have bought up many small manufacturers. And in a few cases integrated them into their operations; in most cases bought them up to shut them down. Just in order to eliminate competition. But unfortunately, also in order to eliminate innovation. To stop innovation in its tracks. They've tended to buy up the most innovative smaller manufacturers. The new startups that came—in most cases—from a person with a disability who had invented their own, and then made it available to others. But it shows that free enterprise can work, sometimes, and that when it's allowed to work—when it's protected from monopoly, which shuts it down—it's also interesting that it was the Democrats who believe in free enterprise. It seemed to be. It was the Carter Administration who made it happen. We could not move forward under the Republicans at that time.

01-00:44:45

Bonney:

Now, you mentioned Debbie, who you later married, in '77. How did you first start to get into the disability movement, per se. I mean, you're in Washington, and you're working for Nader —

01-00:45:02

Hotchkiss:

It was before Washington.

01-00:45:04

Bonney:

OK. Tell me how that came about.

01-00:45:05

Hotchkiss:

That was back in the hospital, in the first couple of—first few weeks. John Schleicker visited me, and here's a guy who's probably a C3, 4 quad, riding in an old electric wheelchair that only starts and stops—has no proportional control. You know, jerk mobile. Who's very politically active—who was pretty much the extent of our movement in northern Illinois at that time, and

was active in Group Psych [?] National Paraplegia Foundation, and he just dragged me in by the ear.

01-00:45:57

Bonney: So what kinds of things did you work on in northern Illinois?

01-00:46:01

Hotchkiss: Curb cuts. Basics. I don't know that we even got as far along as fighting to get kids into schools. I know there was talk about it, but I don't think there was any real, significant activity at that time. Working on universities, to make them more open. Northern Illinois was trying to carry on where the University of Illinois had started, ten years earlier, and make other universities become accessible. I met some other types of groups. Like, I met the Indoor Sports Club. John kind of took me around and showed me what was happening in our field, and here were these overweight wheelchair riders sitting around and playing cards in somebody's garage—those being the only accessible meeting places, were garages. The houses all had three steps. And being served lemonade and cookies by smiling friends. That was entertaining—I think I went twice. But the people who were politically involved—more politically active—were quite interesting in northern Illinois at the time. John had organized this group of people who were fighting for lots of stuff.

01-00:47:38

Bonney: How big a group?

01-00:47:40

Hotchkiss: Probably eight or ten people. We'd get together every month, have ongoing projects.

01-00:47:52

Bonney: So you were working on curb cuts. What else were you working on?

01-00:47:59

Hotchkiss: I don't remember many of the specifics. Public transportation was a distant fantasy, at that time. That was before the 1968 law that required public transportation to become accessible, and I don't think we had much hope for that. Nor was there much in northern Illinois at the time. I think we had two bus lines in town.

01-00:48:33

Bonney: OK. So, you started with the northern Illinois group. What happened next, to get you into the movement more than that?

01-00:48:45

Hotchkiss: Going through college, I always had disabled friends who were somewhat out there. I was the first wheelchair rider at Oberlin, but they admitted another freshman, the same year I came back. So there were two of us, then another woman, who had been walking on crutches, switched to using tricycles and wheelchairs while she was there, because Oberlin had built ramps for the two of us. It was a whole lot better for her, then, all the sudden, to forget her

crutches and move more quickly. We weren't all that well linked with the movement outside Oberlin, but we had our mini-movement. Things really took off in Washington, DC, though—where I met Evan, where I met Dick Hettinger, who was leading the demonstrations against the Washington Metro Subway, which was originally built totally inaccessible, in blatant violation of the '68 law. They said, "Oh, you can ride escalators, can't you?" [laughter] I did ride escalators a lot, and had some amazing accidents as the escalators failed. But I wasn't doing it to show that that's how it should be done. If anything, I was doing it to show how that's not how it should be done. Much to my chagrin, it turned out that way.

01-00:50:36

Bonney: You paid for it, didn't you?

01-00:50:37

Hotchkiss: I paid for it, yeah.

01-00:50:42

Bonney: What else was going on in Washington that you were involved with?

01-00:50:50

Hotchkiss: Nader's Raiders, wheelchair design with the Veterans Administration. Yeah. Wheelchair design really started out with a bang on my first ride outside the hospital in Chicago. Took this \$2,000—in today's money—Everest & Jennings Premier half a block down the street, and hit a crack in the sidewalk, destroyed the front caster assembly. The fork failed—became totally loose on its stem—the bearings in the caster barrel, the bottom bearings failed, at the same time the fork bent—just from hitting this one obstacle. The fork—because it was bent back so far—allowed the front wheel to hit the frame. The frame came down right behind the front wheel. So I couldn't move forward. I had to go backwards back to the hospital. Somebody ended up pulling me back down the sidewalk.

I had been building bicycles all through high school—still have my old 45 speed race from the fifties made out of old junk parts. That bicycle, compared to the wheelchair I had bought for a fortune, was bulletproof. You could ride it over railroad tracks all day, without a worry, as I had done for years and thousands of miles before, according to my odometer. Never had a physical breakdown on that bicycle, nor a bearing failure. Breaks, sure, had to be replaced regularly. Break cables would break down. My seat completely gave in, eventually, from too many railroad tracks. But this wheelchair was just a bad joke. I still use those old wheelchairs for my engineering students. I have them analyze the stress and the strength of the caster assembly. If they say it's OK, I flunk them. But most of them have gotten the word by now, and they criticize it roundly.

So all through the time in Washington—all the through the rest of college, I was working on experimenting with wheelchairs. The first one I built was an

electric-powered stair climber, in '67. It had rubber tracks, like a little caterpillar. It was three feet long, two feet wide, and only one foot high. So you'd sit down on the ground like in a go cart. But that was kind of hard for me to get back up from. So, eventually I put an elevated seat on it, and then I could come up to a table like this, as well. I also would have messed up your rugs with my tracks by now—wrinkled them. Or, if they were inlaid, you would have the tacks popping out in the corners of the room. But it would go up stairs nicely. Those were the years of—what do you call them? Visiting hours in the dormitories at college. The first hint of co-educational dorms. They let us visit until 10 p.m. on Saturday night. This chair was a little undependable—with all the switches, and so forth—to run two big motors to run those tracks. It seemed like it always broke down about 10 p.m. on Saturday night, and I couldn't get back down. [laughter]

01-00:54:45

Bonney: Tell me how you got to Berkeley.

01-00:54:53

Hotchkiss: Debbie Kaplan picked me up hitchhiking in 1974 on Ashby Avenue.

01-00:54:58

Bonney: And why were you here?

01-00:54:59

Hotchkiss: I was visiting for a conference at the Claremont that CIL [The Center for Independent Living] was holding, on disability issues. I was struggling up the hill, up Ashby to the Claremont, and simultaneously trying to hitch a ride. So, she picked me up and gave me a ride in her old Dodge Dart.

01-00:55:28

Bonney: Up to the conference.

01-00:55:30

Hotchkiss: Yep, yep.

01-00:55:31

Bonney: OK. Let's stop there, and change our —

01-00:55:34

Hotchkiss: OK.

[Begin Audiofile 2]

02-00:00:00

Bonney: OK. Just before we changed tapes, we were starting to talk about the conference up at the Claremont Hotel in Berkeley that CIL sponsored. What was the conference about?

02-00:00:17

Hotchkiss: I don't remember. Disability issues. All kinds of them.

02-00:00:20
Bonney: In general.

02-00:00:21
Hotchkiss: Yep.

02-00:00:22
Bonney: And what year was this, about?

02-00:00:23
Hotchkiss: '74. I already knew Judy Heumann, from New York. She had been writing long, long letters to Ralph Nader, wondering why the hell he wasn't involved in the disability movement, because it was the core of everything that mattered. He didn't know what to do with her letters, so he gave them to me. So I had gotten to know Judy Heumann quite well. That's probably why I ended up at this conference.

02-00:00:59
Bonney: She was there?

02-00:01:01
Hotchkiss: She was already at CIL at that point, I think. She had already moved here, I believe. I had already met Hale [Zukas] and Ed Roberts, and a bunch of other people. Herbert—what's his name?

02-00:01:07
Bonney: Willsmore.

02-00:01:30
Hotchkiss: It'll come. Anyway. I stayed with one of them.

02-00:01:37
Bonney: So, at some point, you were—I believe—here, and testified in the 504 [Section 504 of the Rehabilitation Act of 1973] issues that were going on in the Bay Area. Is that right? Didn't you testify?

02-00:01:55
Hotchkiss: I guess so. I probably did. I can't remember. You mean, at the actual demonstration?

02-00:01:58
Bonney: I think it was at the demonstration.

02-00:02:00
Hotchkiss: Right, now who was the congressman who—Miller?

02-00:02:03
Bonney: Miller. Yeah.

02-00:02:04
Hotchkiss: Was it Miller?

02-00:02:05

Bonney: George. Yeah. I think so.

02-00:02:06

Hotchkiss: George Miller. Yeah.

02-00:02:08

Bonney: Tell me about that. How did you get involved with that, or get there?

02-00:02:12

Hotchkiss: That was from DC, really. We had demonstrations in various cities around the country, and both here and in DC we ended up occupying. There it was the – [Joseph A.] Califano, Secretary of HEW, Health, Education, and Welfare. Our group of demonstrators—it was the same group of people who started ACCD, American Coalition of Citizens with Disabilities, which was our failing attempt at having a true cross-disability center of the movement. So, several of us—Eunice Fiorito, Frank Bowe, Fred Fay, Debbie Kaplan—they were all involved in that.

02-00:03:31

Bonney: And this is in Washington?

02-00:03:33

Hotchkiss: In Washington. Yeah. We basically got starved out—after 24 hours, they were physically apprehending HEW employees who were trying to bring us food. They were throwing them to the floor. It was rough. It was DC, it was not California. No medications allowed for people who needed them, and so forth. Nothing. Nothing. So we were starved out, after about 24 hours. So Debbie and I came out—a couple of other people, as well—to San Francisco, and participated in the Miller hearings. We weren't allowed to stay on in the demonstration here. You couldn't enter—only the first group. But we could go in for the day. So, we did.

02-00:04:36

Bonney: When you entered, what did you see going on there?

02-00:04:40

Hotchkiss: We saw people sleeping in the corners, and piles of blankets. We saw people getting fed on Happy Meals or, at least fed on McDonald's food. I saw just a groundswell of community support for the demonstrators, from all around. From the Gray Panthers, from McDonald's, from various commercial and private groups.

02-00:05:17

Bonney: Did you see them organizing? What did the people who were sitting in do every day?

02-00:05:29

Hotchkiss: They waited for their turn to have a shower. That was the biggest occupation of all.

02-00:05:41

Bonney:

OK. Now, in your testimony, what were you testifying about? What were you talking about?

02-00:05:49

Hotchkiss:

I don't remember. Probably—I don't know. Maybe it had something to do with the DC demonstration, and for sure, we were all talking about 504 and the great need for this kind of—for regulations under this legislation, which would begin the process—just begin the process of recognizing our right to be integrated into schools, into jobs, into public housing, and public transportation.

02-00:06:24

Bonney:

What happened to that testimony? How was it used?

02-00:06:33

Hotchkiss:

It was used to persuade Carter and Bell to sign the regulations, which had already been written, which were ready on the table—had been for some time. Just to stop dragging their feet, and to have the guts to just sign it and move on, and begin the still far from completed process of enforcing those regulations.

02-00:07:12

Bonney:

Did Miller take it back to Washington? Did he do anything with —

02-00:07:15

Hotchkiss:

I don't remember exactly what the—I'm sure he did, but I don't—I wasn't there.

02-00:07:24

Bonney:

So you left San Francisco and went back —

02-00:07:27

Hotchkiss:

Eventually, yeah.

02-00:07:28

Bonney:

— to Washington, right?

02-00:07:29

Hotchkiss:

Yeah.

02-00:07:29

Bonney:

Where were you, when you found out the regs had been signed?

02-00:07:35

Hotchkiss:

Back in DC. Don't remember the day, or anything.

02-00:07:38

Bonney:

Don't remember hearing about it the first time, or anything going on, or celebrations? Nothing?

02-00:07:47

Hotchkiss: No—I don't know—we were kind of cynical in those days. It was just, "OK. Over this hurdle. Now we have the mountain range in head of us. You've gotten over the foothills, but it's just the beginning."

02-00:08:02

Bonney: So there wasn't a celebration, or a party among people, or —

02-00:08:04

Hotchkiss: Oh, there probably was. I just don't remember that.

02-00:08:07

Bonney: You don't remember. OK. All right.

02-00:08:12

Hotchkiss: But by the time it finally got through—I mean, this was years, and four years of active work by ACCD people, mostly, were the ones I was involved with. By the time it finally happened, we didn't believe it was a great victory. By then, we had been convinced that it was just a little chink in the armor that we had broken open, but that didn't mean that anything was going to move without being pushed, from then on. I believe that history shows we were right.

02-00:08:55

Bonney: Right. Now, you were a member of ACCD?

02-00:08:58

Hotchkiss: Yep.

02-00:08:59

Bonney: What was that group doing?

02-00:09:03

Hotchkiss: We were trying to form a cross-disability advocacy group, to work on federal legislation.

02-00:09:14

Bonney: In addition to 504. Not just 504.

02-00:09:17

Hotchkiss: Every aspect. I mean, there was the 1960 Act that covered access to federally funded facilities. That covered all kinds of things, from buildings to buses. The work was infinite. People like Dick Hettinger were among the most effective of that group. Did anybody do an interview with Dick Hettinger? It would be worthwhile. He was a government employee. He was a computer whiz—now retired. Organizing some of the first networked computers within—I think it was GAO [Government Accounting Office]. He was fearless. The most frustrating part of my years in DC with the disability movement was the conservatism of the federally employed people with disabilities—that they were afraid to stick their necks out. Very afraid, because they thought they'd lose their jobs. Dick was the classic exception.

02-00:10:38

Bonney: What was his disability?

02-00:10:40

Hotchkiss: Probably polio. He drove a '56 Chevy—the last year when Chevy had a flat floor? Haul his folding wheelchair behind the driver's seat. His wife had a similar disability, and wheelchair, and they had these two '56 Chevys. He was just so practical, and so down to earth. Fred Fay, of course, was very active. We held all the meetings at his mother's house. They were akin to the early meetings in Illinois: always in somebody's house, with somebody like Fred's mother cooking us great stuff.

02-00:11:31

Bonney: So, when did you move to Berkeley?

02-00:11:36

Hotchkiss: '79.

02-00:11:37

Bonney: To the Bay Area.

02-00:11:38

Hotchkiss: Yep. End of '79, beginning of '80.

02-00:11:40

Bonney: OK. And why did you decide to leave Washington and come here?

02-00:11:45

Hotchkiss: Reagan was coming. I can only take so much of that—of DC, of running to fight fires endlessly, just to be outmaneuvered. In Transbus years, for example, we would work diligently to block laws or amendments—usually it was amendments, that you snuck into something else—coming up on the Hill—that would have been passed if we hadn't have been—I'm thinking of exceptions to access to public transportation that were being pushed through by people like General Motors, who was our biggest opposition, who had met with Ronald Reagan, and gotten him to completely uproot the Transbus specifications, and replace them with a parts list for a new General Motors bus—high floor bus. Just like the old buses, as far as we were concerned.

We would fight, fight, fight, staying up all night, writing testimony, delivering it in the morning. You know, reading it in the committee meetings, and we would smash one or another amendment, just with the facts—just with the facts. Just as we would breathe a sigh of relief, having done that, we'd hear there might be two or three similar amendments, sometimes identical, coming through other committees that had snuck by us. We didn't have enough connections on the Hill to hear about everything. They had power. They had connections, and they had money, and they had staff, and they could beat us. It was just so frustrating. There were very, very few mechanics and inventors in the whole DC area, whereas Berkeley was full of wheelchair inventors. Debbie burned out as well, I believe, and wanted to get back here, where

things were happening in a different way. Here, we were setting an example. There, we were just struggling. And not getting the help of most of the people—most of the professional disabled people there had government or government-related jobs, and were very reluctant to stick their necks out, to participate in any substantial way. That also was one of the reasons just to come back here.

02-00:14:44

Bonney:

I want to go back just a minute to the ACCD. In your opinion, why was it not successful? I mean, it lasted for a number of years —

02-00:14:54

Hotchkiss:

It lasted for quite a number of years—

02-00:14:55

Bonney:

— and it did quite a bit of lobbying and advocacy work, but —

02-00:15:00

Hotchkiss:

Yeah. It was—there were differences between individuals involved. There were communication issues, between deaf folks and the rest of us. There were ego problems, with some of the individuals. I would call them problems, because that seemed to get in the way of working together, some of the ego issues. It's like any such group. It had its internal problems, and that made it harder to carry it on. There was not enough work done in grooming new leadership. I think that was perhaps the core of the problem. It was a very difficult group to keep together, for the very reason that we don't have cross-disability groups that are very strong. Never have. Blind people have their own history, going back 100 years before the rest of us got organized—or 50 years, anyway. Deaf people have not only their own advocacy history, but their own culture. And none of us outside that culture—very few of us learned signing. I never did. Felt bad about that the whole time. I only knew like a dozen words. I knew how to tell bad jokes, but that was all.

02-00:16:48

Bonney:

It's actually a hard thing to learn. I mean, I took classes for a year, and at that point I could talk elementary words to people, but it's a hard language —

02-00:16:59

Hotchkiss:

[inaudible] working in a factory of deaf wheelchair builders in Managua—had been for several years. They have kind of their own language, so visiting deaf people from here have trouble there, and visiting deaf people from Managua, even have some limits to their communication with people. The people within this factory have their own technical talk, that's kind of shorthand. Yeah, it's hard. There's no question. It's hard for us.

02-00:17:38

Bonney:

Well, let's turn the focus, then, to your Third World activities. In 1981, I think, was the first trip to Nicaragua —

02-00:17:48

Hotchkiss: 1980. January of '80.

02-00:17:48

Bonney: 1980? Was the first trip to Nicaragua. How did all of that come about?

02-00:18:02

Hotchkiss: Bruce Curtis cooked it up. Another one of the activists who would commute to DC and raise a ruckus, filling in the gaps left by all the DC professionals, who would shy away when things got hot. They would come to all of our pre-meetings, but wouldn't follow through. Hale Zukas—side story—Hale used to commute to DC to lobby, and once, he was going back, and I arranged to fly with him and his assistant on the same flight. So we got into the seats—all set up. Zukas, of course, by the window, because he's got to be reading his aeronautical maps all the way across the country. And then all of the sudden, his assistant disappeared. I asked him, "So, where is he?" He said, "Oh, no. He's not coming. He's not coming." So the whole way across the country, I had to balance the tray, feed Zukas, who eats endlessly, and hold his huge aeronautical maps so that he could see every detail of which markers we were crossing.

02-00:19:35

Bonney: That's a long flight.

02-00:19:37

Hotchkiss: It was five hours. It was an experience.

02-00:19:43

Bonney: So, who would—this is a little side story—who would assist Hale when he got to Washington? Did he have people on both ends?

02-00:19:52

Hotchkiss: Somebody else appeared like magic. [laughter] Otherwise, who knows? Otherwise, it would have been like it was when Hale would stay in my house in Washington, and I would have to be his attendant there. The people in the group house I lived in—a big old downtown house, with lots of students and Nader's Raiders in it—they would be out in the big room eating breakfast. We would be in the living room where I slept, and they would just hear all these clunks, and thuds, and crashes as I would try and get Zukas out of the bed and into his chair. Then, once I got him into the chair, then I would try to set him upright. Basically, throw him up from the too-low bed into the too-high chairs. And it didn't matter which way he ended up—just get him up there, and then turn him upside up.

02-00:20:53

Bonney: Did he stay with you a lot?

02-00:20:56

Hotchkiss: A good number of times. Even Judy Heumann stayed with me a few times, and we would carefully arrange for her not to have attendants. Once I offered

her a ride from Washington to DC in my old '63 mail truck—an old step van, with a rope-powered wooden lift on the back, and I told her I had somebody else going with us who could help out, which was true until that person left, and then that person wasn't there. I played the same thing Zukas did on me on her. So she had to accept me as her helper.

02-00:21:46

Bonney: Was she happy about this?

02-00:21:47

Hotchkiss: No. [laughter] Never.

02-00:21:50

Bonney: Has she ever let you forget it?

02-00:21:52

Hotchkiss: No. [laughter] So—where were we? Managua.

02-00:21:59

Bonney: Managua. Yeah. How did you get there the first time?

02-00:22:01

Hotchkiss: OK, so Bruce had already been down there with a few others—Marilyn Golden came down on the trip I went on. Bruce, I think, was our scout, and he came back and said, "There are all these people down there with these broken wheelchairs. They're mostly American wheelchairs, so you have the parts. You know how to fix them. Can you come down there, and bring all the parts and all the tools you can?" Ed Roberts will give you a ticket. Ed Roberts somehow—I suppose—hired me as a consultant to DVR [in the California Department of Vocational Rehabilitation], and gave me a ticket to Nicaragua, and I probably did something actual—some real stuff for him.

02-00:22:52

Bonney: But you don't remember?

02-00:22:53

Hotchkiss: I don't remember. I probably wrote up a report or something like that. But —

02-00:23:00

Bonney: So, DR funded the first trip down to—or just yours?

02-00:23:03

Hotchkiss: My ticket, anyway. Maybe Bruce's, too. There was probably an inter-disability movement collaboration, something like that. I mean, we did a lot of that. Just amazing that it was paid for, only because [Governor Jerry] Brown was there, and Ed was there. So we went down, and we went to this Santo Rigoevu Rehabilitacion Aldochavaria {sp?}, the Managua rehab center—very small place. Kind of a disconnected bunch of falling down buildings—little one-story buildings in the field, on the edge of town. We saw plenty of broken wheelchairs, but we saw many, many more people than we saw wheelchairs.

It turned out that almost everybody in that rehab center had only a part share in a chair. Since these chairs were broken half the time, anyway, that meant that one group of young fellows whom I worked with the most, each one had an eighth share of a chair—there were four of them, but the chair only worked half the time. So they had an eighth of their time.

When they got their turn, they would almost invariably head clear across Managua, heading for some young woman, to go visit and see if they still had a relationship. That chair would rarely make the roundtrip, because it was an American hospital box. It was weak. Very, very poorly designed. But they had a welder that they would take the chair to, then, and they would work with the welder and figure out why it had failed, and reinforce it so it wouldn't fail again, and then they would reinforce the other side of the chair in the same way, so that even though it hadn't broken, it wouldn't break in the future. Their chair had over 20 reinforcements. It was very good. It seemed to me that they knew more about the stresses and strains on wheelchairs than the U.S. industry put together—certainly than Everest & Jennings, which was the U.S. industry at that time. They took a good look at my chair, which was a four-wheel drive manual chair, at the time—kind of a high-tech, fancy, homemade version, that I had worked with the VA [Veteran's Administration] on in the earlier years. They said, "Well, that looks like a great chair. It goes through mud and rocks very well, but it looks like it's going to break there, there, and there. It's a little weak in those spots. Don't you think you ought to fix it?" They were absolutely right. Later on, I found, when it did break —

02-00:26:09

Bonney:

That's where it was.

02-00:26:11

Hotchkiss:

Yep. That's where it was. "And, by the way," they said, "Can you find some way to help us start up a shop? Can you find some American money, or something? Because we'd like not to keep fixing this chair, we'd like to make four new ones, and then make a few more besides. We can make them better than yours." They had very specific ideas how they wanted to make a chair starting from scratch, integrating all the reinforcements they had on their hospital junker, but doing it in a simpler, and a lighter, and a sportier way. So, just by stroke of luck, we found money in Washington, DC. It was kind of left-over Carter Administration money from a group called Appropriate Technology International, which was an E.F. Schumacher/Small is Beautiful connected group, and it started by an act of Congress a few years earlier, and hadn't yet been shut down by the new administration. They were working with farmers in Guatemala who were disabled, and working on things like raising some of the beds for vegetable farming, and having endless trouble with the wheelchairs these guys had. They were skinny-tired, hard-tired, hospital boxes, and they wouldn't go through even good, packed, pathways.

02-00:27:52

Bonney:

Where did they get these wheelchairs?

02-00:27:55

Hotchkiss: They were donations from the U.S. If you have kind of an obsolete wheelchair in the U.S., you can either pay the garbage man—say, slip him a ten dollar tip and they'll take it away for you, or you can donate it and take a \$300 tax deduction.

02-00:28:15

Bonney: So, are these literally coming from hospitals? Chairs that are just too old, or —

02-00:28:20

Hotchkiss: Well, at that time, there wasn't much else but the hospital chair. Even our Premiers were kind of souped-up hospital models. They weren't any stronger than the hospital models, and so they were from a variety of sources. Some were from hospitals, most were from individuals—somebody who had been injured, used it for a while, then bought another model, and needed to get rid of some of the old chairs they had. So they would often arrive in Nicaragua already broken. There were groups collecting them here and shipping them down. Still happens a lot today. Luckily, some of the groups are now rebuilding them in a much better way than used to happen, and working in a little bit more integral way with the local disability communities to set up ongoing wheelchair repair.

02-00:29:12

Bonney: Now, these first few guys that you met when you went down there, did they work? I mean, how did they support themselves, how did —

02-00:29:19

Hotchkiss: They were newly injured and they were still in the hospital. They were being supported by the hospital and their families. One of those four I'm still in contact with. He started working right out of the hospital, doing odd jobs, repair work, various things. Eventually, he became our lead mechanic in the wheelchair shop. So we did a job there for years. He came up here in—I think—'86. Studied at Laney [College] for years. When he got good enough at English, then he could get into Berkeley, and he studied engineering there. Now he's a space scientist at NASA Ames. He's still building out Whirlwind style chairs. He has an outrageous one that's made out of NASA materials.

02-00:30:18

Bonney: So, what did you see when you went down there in 1980, in terms of the politics—it was the Sandinistas, at that point, were in power. What was the relationship between these hospitals or rehab centers—the people that needed medical attention and help—did they get it?

02-00:30:45

Hotchkiss: They got it. What there was they got. There wasn't enough, but they squeezed the people in somehow. Some people slept in the hall. And, of course, shared the wheelchairs, and so forth. But it was a government hospital, and it worked, more or less, I think largely because of Dr. Lances [sp?], who was the

physiatrist of the hospital. He was such a good spirit, such a hard worker—another Henry Betts. He just built that up and kept it going, and would lobby for the funds it needed, and get those funds from the government, from private sources, from international aid agencies. He would pull it in from everywhere he could find it. Very, very active sort of fellow, who was juggling twenty or thirty balls at any given moment, and had all the names of all the people on the tip of his tongue.

02-00:31:54

Bonney:

So, did this experience, when you went down there for the first time—how did it change you? Did it influence you in any way?

02-00:32:02

Hotchkiss:

Oh, yeah.

02-00:32:03

Bonney:

What happened?

02-00:32:16

Hotchkiss:

Saw how disgusting the influence of our wealth is on the real world—on the 80 percent of the world. Saw the extent to which we have taken, and they have not. Saw what life is like—what it must have been like in dynasties, in the feudal times. Nicaragua was a very feudal society. There were a few families that owned the country. Of course, those families had been pushed out, and supposedly the dictator and his close associates had owned 70 per cent of the country—of everything in the country. And so 70 per cent was—they were trying to reorganize it, and that was difficult. It was an impossible task. But the extent to which—first the gross differences in wealth and poverty. The poverty was so, so low. Starvation was all around. Illiteracy was—people of our age had never been to school, had never had the opportunity, unless they were from the upper, upper crust. And that's all frustrating, but to see it from the disability perspective, where people with disabilities, if they function at all—even today—do so almost exclusively because of the effort of their extended families.

There was a period through the eighties of greater integration, but thanks to us, it was one of the most difficult periods in the history of any Central American country, because we were at war with them throughout that period. We were blockading the frontiers, and not allowing ball bearings to get in to fix the wheelchairs. They couldn't get tubing. They couldn't get parts to repair their tubing factory. They couldn't get the basics that they needed to try to build the infrastructure that people with disabilities need to make it from day to day.

I also learned a lot of, lot of respect for people with disabilities who are actually making it under those circumstances. Who are actually raising their children and getting them to school. Who are actually making quantum leaps in the health and welfare of the next generation, while almost not being able to

survive themselves. In fact, most of my friends, now—from the early years of Nicaragua—are no longer alive. Every time I go down there, the first thing we do is do another count of who's missing. Just lost a very strong ally, just a few weeks ago. Pressure sore. And that's primarily because he didn't have the ten dollars to buy the cushion material that he needs to replace every year or more frequently, to protect himself from basic pressure sores. He tried. He sure tried. Again, he was raising kids, and he was keeping a business going, and he was doing everything necessary to survive, with no help from anybody except his family members. But they can only fight so long and so hard.

02-00:36:55

Bonney: Were you and your group able to get parts into Nicaragua —

02-00:37:00

Hotchkiss: Oh, yeah.

02-00:37:00

Bonney: — by going there yourself, and taking —

02-00:37:01

Hotchkiss: By carrying them. By carrying them. Right. And we even ship things, too.

02-00:37:05

Bonney: Oh, so you were able to get it through the —

02-00:37:07

Hotchkiss: But mostly we carried it. Getting it into Nicaragua was no problem whatsoever. We never had to pay a single cent of duty, nor a single bribe. It was never requested, there was never any problem. Much different from some countries, where I've had to spend hours getting through customs, just because I refuse to pay—refuse to slip them the \$20 or the \$50 that they're literally asking for. I just say, "Show me your supervisor." And then that supervisor's supervisor, and on up the ladder. I do not back down. But Nicaragua was never a problem. We brought in everything we could, and Eastern Airlines—bless their hearts—they would approve 20 boxes for a couple of people, and just—and it would go. They knew exactly what we were up to.

02-00:38:10

Bonney: Do they still do that?

02-00:38:11

Hotchkiss: Eastern went out of business a long time ago.

02-00:38:12

Bonney: I mean, they're gone, I guess.

02-00:38:15

Hotchkiss: Yeah. Now it's a bit different.

02-00:38:18

Bonney: Nobody else does that? Other airlines?

02-00:38:20

Hotchkiss: No.

02-00:38:23

Bonney: Well, you touched on something I wanted to follow up on—this cushion issue. I read someplace that in these Third World countries, even today, if someone does get a pressure sore that they usually die within a year.

02-00:38:42

Hotchkiss: If they have a spinal cord injury. Yep. And most—various informal surveys by physiatrists say that within two years, over 90 per cent of the people with complete spinal cord injury are no longer around, and in almost all cases, it's due to pressure sores.

02-00:39:10

Bonney: So, is your group at all focusing on —

02-00:39:13

Hotchkiss: Oh, yeah.

02-00:39:13

Bonney: — cushions, or a way to sort of answer that need?

02-00:39:17

Hotchkiss: Well, we try to do it through designing good cushions, and we've made slow progress. In the early eighties, we did it out of corrugated cardboard. We'd take 15 layers of corrugated cardboard, bend them a little bit to match the sling of the seat, glue them together with flour and water paste, so you'd have an inch and a half thick kind of hard cushion base. Then we would cut out, with a little keyhole saw, at an angle around the butt bones and the tail bone. Then wet the thing down thoroughly, and then sit in it for half an hour.

02-00:40:02

Bonney: Oh, to form it to their body.

02-00:40:03

Hotchkiss: And it would form. It was papier-mâché. Then we would dry it again, leave it in the sun for a good day, and then varnish it, so it would be water resistant. Then we'd put as much good foam as we could on top of it—the stiffest foam we could find. Short of chipped foam, but stiffest regular cushion foam we could find. The best foam we ever found—still using it in—is second-hand foam from U.S. school buses. Very high quality foam in the seats. They almost always take out two or four seats from the very back of the bus, so there's plenty of room for the chickens and the wheelchairs. That means that there's a big used market for seat parts. So that's where we get our best foam at the most reasonable price. So we put foam on top of that cardboard base, and it worked very well. I have a very sensitive butt myself, about as bony as they get, and a well-made cushion of that type doesn't give me red spots, even. Sometimes, I need to fudge it a little bit—do a little bit of extra cutting here or there to [inaudible] —

02-00:41:28

Bonney:

Is there any kind of international movement to provide cushions to people? I mean, it seems like such a simple solution to something that —

02-00:41:36

Hotchkiss:

Not very big. We have a sister group in Britain, called Motivation. They started in 1990—some students who had been to Bangladesh, and done wheelchair design there. Then they came here, took our course at [San Francisco] State. We've been working together ever since. They're now training people in building our types of chairs, as well as hand-powered tricycles, in Tanzania. With them, and with others at the Rehab Engineering Society of North America, [now known as RESNA] for years, we had a cushion design competition for developing countries, and had a lot of good entries—many good entries. We also had a poster contest, and we made many, many posters that went up in the rehab centers around the world, showing how critical—people don't realize that it's life-threatening, because they haven't known anyone with a spinal cord injury who survived. There's no peer support surviving in so many places. We had cushions made out of beans, and rice, and wheat, and straw, and coconut hulls, and inner tubes. All kinds of materials. Some of them worked very, very well.

So all that information has been generated. Our cardboard cushion bases have evolved into using recycled chip foam—the multicolored stuff that's often used under carpets in this country. We have standard patterns, published by us and by the Motivation group, that we—working together—have evolved the design. They're pretty good universal cushions. They're likely to fit most anybody, even if they haven't been custom fit. The cardboard system was more precise for the individual, but it took all day to make it, and it didn't happen as often. This way, we can have them pre-produced, and just pick them by size and then cut them a little bit with a carving knife, if they need to be modified. If people know how to look for red spots, or hot spots, or [hard?] spots

02-00:44:02

Bonney:

Or even know to do that.

02-00:44:05

Hotchkiss:

Yeah. All of that.

02-00:44:07

Bonney:

Now, you also took medicine to Nicaragua, did you not? At least the first trip?

02-00:44:13

Hotchkiss:

I still take it.

02-00:44:14

Bonney:

You do?

02-00:44:15

Hotchkiss:

Wherever I go, I have a little pharmacy under my cushion.

02-00:44:18

Bonney: I was going to say, how do you get it, where do you get—what kinds of medicine are you taking them?

02-00:44:23

Hotchkiss: Mandelamine.

02-00:44:24

Bonney: What does that do?

02-00:44:24

Hotchkiss: That's a bladder infection prevention—it's a very innocuous, low-power bladder infection presenter. Money is the best medicine, because you can buy things cheaper in most countries than here.

02-00:44:41

Bonney: So, it's available there, if they had the money to buy this there?

02-00:44:45

Hotchkiss: Yes. Yes.

02-00:44:46

Bonney: Do they usually have enough money to buy this stuff if they know about it?

02-00:44:49

Hotchkiss: No. No.

02-00:44:51

Bonney: They don't. What do they do to support themselves?

02-00:44:57

Hotchkiss: All over the world, people with disabilities are working in family industries—family businesses, interacting with their extended families if they have one, and if they can. That's the most common. For example, TV / radio repair. Folks with disabilities are highly educated in that, and do work that our repair stores here would never do. We would replace the parts. They fix the switches, the volume controls, the plug sockets—do all kinds of physical rebuilding of teeny, teeny parts that I can hardly see. Amazing, the extent to which repair is done by some of these folks. Sewing is common. Clothing repair or modification. Cooking. Vending. People with tricycles—in the town in Nicaragua where I always stay, Chinandega, there are six tricycle riders, who are on the street all day, every day, making a living—hand bar tricycles.

Every one of them has a variety of businesses all at once. They'll be hauling things, they'll be buying and selling, a couple do repairs of different things. They'll buy bicycle parts, and distribute them to some of the little local bike mechanics. It seems there's a bike mechanic every block or two, just working on somebody's yard or on the sidewalk. And one of the tricycle riders will distribute parts among them. Lots of industries. They live on very, very, very little. Eating a McDonald's hamburger is way, way too expensive.

02-00:47:08

Bonney:

Right. You were talking a little bit about Reagan coming into Washington, which is one reason you left. In the middle eighties, he was working with the Contras to get the Sandinistas out, and supporting the Contras —

02-00:47:26

Hotchkiss:

Right. He was at war with Nicaragua.

02-00:47:28

Bonney:

How did all of that—because, didn't he embargo, or do something?

02-00:47:34

Hotchkiss:

There was an embargo on us shipping parts to Nicaragua. I could still carry stuff down, but there was a period in which we couldn't send things from American ports. We had to carry it. Then it was just—it just left us luggage. They weren't inspecting everything we were carrying out of the country. But, it was a very heavy time. Some of the disabled folks died during that period, due to pure lack of antibiotics—pressure sores and bladder infections. Omart Alaviren {sp?} nearly died twice. He was right on the edge. He was in the hospital, and he was so sick from bladder infections that—thank goodness we found a way to get him up here. Otherwise, we wouldn't have him to work for NASA. He wouldn't have made it. His illnesses were entirely due to the unavailability of antibiotics. The whole hospitals were full of people who had infections they couldn't fight. There was nothing. No way to get the antibiotics in. They would be smuggled in from Guatemala, and Costa Rica, and there was a mole via El Salvador and Honduras, or straight by water. At times, we were blockading, even. And so, that would close off their ports. That's when it got hardest.

02-00:49:30

Bonney:

How were most of the activities funded? You said you got a grant, initially, from Washington —

02-00:49:36

Hotchkiss:

Appropriate Technologies International.

02-00:49:38

Bonney:

Yes. Who all funded these activities?

02-00:49:41

Hotchkiss:

We've had many, many funders. Never quite enough. Not close. But somehow, we managed to keep going. They have been—they've ranged from some from the United Nations, some from USAID—both of them have been intermittent. They don't go for long, and then they get—so they haven't lead to long-term—they've been start-up funds, you might call them. Some of the stablest and most useful money has come from disability groups in the Scandinavian countries. Fedida [sp?] in Finland—Fedida is a cross-disabilities group. It's like the ACCD of Finland. There are cross-disability groups dating back to about when we did ACCD that have been much, much more successful in the Scandinavian countries. Those groups have—years ago, now,

20 years ago, plus or minus—gotten legislation passed that gives the disability groups a guaranteed allotment of their aid money, and lets them—the disability groups raise 10 per cent, the government provides 90 per cent, and the disability group then works with organizations of people with disabilities in developing countries, and does development. In Finland, that funded our working with a group called Disacare in Lusaka, Zambia. When we started in '92, they were already two years old. The Fins had been bringing down second-hand wheelchairs in large numbers, and the group had been rebuilding them in Lusaka. There were a bunch of teenagers – AIDS [Auto Immune Deficiency Syndrome] orphans with disabilities. They were mostly from rural villages that had been decimated by AIDS, and they were street people in the city, basically. Now they have a string of new houses, they have several-acre plot with a big wall around it, and a basketball court inside.

02-00:52:26

Bonney:

How did they do all that?

02-00:52:29

Hotchkiss:

They got the land from Kenneth Kaunda, their previous—he's been called a benevolent dictator. He was already out of office when they got the land, but he's still there in house arrest, and functioning. They raised the money from a variety of sources—mostly outside the country, mostly via the Finnish organization of people with disabilities. They serve as our African training center. They've taken people for months at a time from any country in Africa, and will send them home after that with a full knowledge of how to build wheelchairs, how to run a factory, how to run the business, as well as carrying jigs and fixtures to set up when they get home.

02-00:53:22

Bonney:

So, when they go home, then, to their own country, do they have to find the resources to develop all that?

02-00:53:30

Hotchkiss:

All the groups we work with are independent.

02-00:53:31

Bonney:

How do they do that?

02-00:53:33

Hotchkiss:

They're people with disabilities. They don't back off. They don't have any other opportunities, so if they starve, they starve for a year or two. They don't go find another job and disappear from the wheelchair factories, or from the disability organizations. They're still there. So, it's—I hate to say that we're taking advantage of their difficulties, but that's how it is, and they—these folks just don't back off. They just keep plugging.

02-00:54:11

Bonney:

OK. What was the Disabled International Support Effort? DISE?

02-00:54:21

Hotchkiss: DISE was our first group working with Nicaragua. Marilyn Golden, Karen Parker, Bruce Curtis—a bunch of us who had been down there on that January trip put together DISE. The city of Oakland gave us a warehouse, and we filled it with old wheelchairs. They're easy to come by, broken ones, and we would swap parts on the wheelchairs, and reassemble them on these Saturday construction parties. And then—in most cases—carry them all down, with the great help of Eastern Airlines. We never made any contact with any executives at Eastern that I know of. It was just the people in the airport.

02-00:55:13

Bonney: Undercover...

02-00:55:14

Hotchkiss: Undercover.

02-00:55:14

Bonney: Just do it.

02-00:55:15

Hotchkiss: Yep. Just did it. We kept on with that for several years, until they reached the point in Nicaragua where they could make the chairs easier than they could rebuild the junk we were sending down. That was the intent from the very beginning—the Nicaraguans could see that they could build a chair from scratch easier than they could fix that first chair that the four boys shared, but it took us a while to get there. Took us years to get there. We had to design the chair, for a starter. Once we reached that point, DISE kind of slowly withered. There was less for it to do. There was less need. We needed some parts. We shipped parts long after we stopped shipping chairs. We got help from a group in the Philippines, going in a couple of weeks—a group that had been building chairs since the mid-seventies—a group called The House With No Stairs, started by a quadriplegic fellow from Australia, who has a chain of men's stores, and has been visiting the Philippines every six months for about 30 years now.

02-00:56:49

Bonney: We have about one or two minutes left. Approximately how many shops now exist, that started—came about because of your efforts?

02-00:56:59

Hotchkiss: There are shops in about 45 countries. 50-some shops. About 50 shops, 45 countries.

02-00:57:06

Bonney: And how many chairs do you produce a year? How many do they make?

02-00:57:11

Hotchkiss: Not sure what the most recent count would be. It's something in the neighborhood of 12-15,000.

02-00:57:18

Bonney: Wow. With all indigenous products, from their own country. Pretty much.

02-00:57:25

Hotchkiss: New tubing. New bicycle parts—that all available locally.

02-00:57:32

Bonney: OK. We're going to need to stop.

Interview #2: May 11, 2007

[Begin Audiofile 3]

03-00:00:00

Bonney: OK. This is the Ralf Hotchkiss Interview, Interview Two. It's Friday, May 11, 2007. Ralf, I want to go back to a couple of things we talked about in our previous interview, before we move on. One of the things I wanted to find out is—you mentioned yesterday, when you went to Nicaragua, you took wheelchairs, and parts, and stuff down, but you also took medicine down for bladder infections, and that sort of thing. How did you get the medicine in this country? I mean, where did it come from, and how did you get it down there?

03-00:00:45

Hotchkiss: It was all leftovers from individuals in the disabled community here in Berkeley. So, if somebody, for example, had had a change of medication—the bug they were fighting had changed, and they had to stop taking one antibiotic and switch to another—they would have had leftovers, or they could have had leftovers, and they would let us know. Other people had—just had accumulated extra, because they kept forgetting to take their medications. Things like Mandelamine, which is something that people take forever, is one that people also tend to accumulate extra of. It's inexpensive. It's no longer even a prescription medication here, but at that time, it was.

03-00:01:40

Bonney: OK. And then, the other thing I wanted to talk about—I don't think we covered it yesterday—is, when you went down to Nicaragua the first time, in 1980, I don't assume that you had any idea that you were going to start building wheelchair repair places and shops where you were going to start building chairs from scratch. How did that whole idea evolve?

03-00:02:08

Hotchkiss: I imagined it would be easy—that I'd just go down, and show a few of the students in the rehab center how to fix their own chairs, and they would go on and teach others, and chairs might get fixed. But there were no parts to fix the chairs. It was much more difficult than we had thought. The need for wheelchair repair was everywhere. It was those youngsters in the rehab center who basically insisted that we do something—not just to set up wheelchair repair, but to build chairs. They could see that it was far more effective to make a good chair than to keep fixing these not so good chairs—in fact, in some cases, these very bad chairs. They could also see that it would likely be easier to build a chair from scratch than to keep modifying chairs, as they had done to theirs. I mean, they had reinforced it in—we counted 20 different places. They had had to make 20 structural changes in the chair with welds, with added material. They had chopped it, widened it, lowered it, so that it wouldn't tip over all the time. It still wasn't very stable. The chair I was riding at the time was quite stable, by comparison. They didn't intend to waste their time just playing with our old technology. They wanted to move ahead. They

wanted to leap frog over us, and make chairs that they thought could be better than what they could ever buy in the U.S. And lucky, it turned out to be true.

03-00:04:01

Bonney:

So, what did you and the people who went down there do to help them get this started?

03-00:04:09

Hotchkiss:

Most importantly, we found some financial support in the U.S.—Appropriate Technology International. Gave them a contract, AID gave them a contract to set up Nicaragua's first independent living center. There was one woman in the U.S. embassy there who translated their proposals and helped kind of nurse them through learning how to run a nonprofit. They were teenagers. The oldest were in their very early twenties, and they were quite green at this. But it was the daughter of the ambassador of the Carter Administration, who still worked in the embassy, who helped them through every step of the process. She also did a little bit of creative translation, so that what she translated into the Center for Independent Living of Managua, Nicaragua, in Spanish was The Organization of Disabled Revolutions [ORD], Che Guevara, and that allowed it to go through our bureaucracy unimpeded—the fact that she creatively translated that. As a result, we may have been the longest funded socially progressive U.S.-funded project going on in Nicaragua, going on well into the Reagan Administration, and into our Contra war against Nicaragua.

We were still funding them inside Nicaragua, despite what else we were doing, whereas every other project—at least that I had contact with—had been cut off earlier—had been just basically abandoned. By the time we finally were cut off, it was about 1984, after three years of steady support. By then, we had contacts with a Swedish organization of disabled people, who had control over some of their government aid money. They would—like the Finns in Zambia—the Swedes would raise 10 per cent, and the government would guarantee them 90 per cent match, and the disability organization then would choose organizations to work with in developing countries, and they chose the ORD—the Managua group—and supported them through the later eighties very steadily. Again, not with large amounts of money, by any means, but steady amounts of money. I believe that that's more important than how much it is. In fact, it may be better in some cases to keep it as small as will function, because the local people, then—knowing that there was going to be a steady trickle of outside support—they could use that to leverage local support, they could use that to buy materials that they would then turn into wheelchairs that were worth a lot more than the materials, resell those wheelchairs, make more money than they had taken in.

03-00:07:46

Bonney:

Are they still funded that way, or what happens now?

03-00:07:49

Hotchkiss:

They're still there. They're funded by Italian sources, sometimes Swedish, sometimes they've been supported also by French sources. They tend to run at a very steady, low level. They're not making that many chairs any more. There are now four other shops in Managua alone, all of which have spun out of this original shop. People from that shop have started others. Six other shops—so a total of seven shops in Nicaragua, right now, are all operating.

03-00:08:33

Bonney:

Do they get any assistance from their own government?

03-00:08:37

Hotchkiss:

Yes. Their government buys chairs. It's a process where people with disabilities need to get in the waiting list, and need to specify exactly what they want, and it works fairly well, but it doesn't—there's not enough money for the whole need.

03-00:09:00

Bonney:

Can you remember the name of the ambassador's daughter?

03-00:09:04

Hotchkiss:

White was her last night. Her first name, I don't remember.

03-00:09:13

Bonney:

Tell me a little bit about the independent living center that started up in Managua.

03-00:09:23

Hotchkiss:

It was formed by about a dozen people. It was a dozen people working in the center, but then scores of people outside who were members. They were very politically active. They got some pretty good architectural barrier laws passed, just in their first couple of years. Carrying those regulations out has hardly begun, but—yeah, Nicaragua, in recent years, has done some of the most creative invention of inaccessible environments that I've seen anywhere in the world. They've created huge traffic circles, and pushed pedestrian traffic a block or more away from those circles in every direction. So, if you need to cross the circle—which will be a block wide—you may need to go a full kilometer to get to the other side. It also has to be one of the most dangerous pedestrian situations in the world. Just in the recent construction.

03-00:10:43

Bonney:

Is that because they don't have laws to address the issue—architectural standards, or —

03-00:10:50

Hotchkiss:

They have an architectural barriers law, but it has never found its way into the street codes. People who are doing the streets—God knows where they get their information. There's plenty of good information available for roadway design. There was in the sixties when I worked with Nader. It was well developed. But these guys are going rapidly backwards.

03-00:11:21

Bonney:

Is the group trying to address that somehow? Or what can they do?

03-00:11:26

Hotchkiss:

They could, but it's now been 25, 27 years. The political oomph that they had in the eighties has subsided. People with disabilities are not well organized anymore in Nicaragua, like they were. There's not much of a political force to deal with things like road construction programs. It would be a full time job for a few people, to work just on that one issue, and there's nobody. A lot of the early folks are no longer around. A lot of them have died, and are dying every year now—dying young. The situation for employment, if anything, has gotten worse in recent years for people with disabilities. The few who I know who are employed are partially employed, and not in a real job. They're doing stuff on their own—they're selling stuff in the streets. Some are begging. Some are doing repair work in their homes, that sort of thing. But it's quite inadequate. The general feeling of the movement—of activists, disabled folks—at least the ones that I know—has gone from a feeling of great spirit and seeing change to depression, to just kind of giving up.

03-00:13:06

Bonney:

Is there a younger generation of activists coming through these countries?

03-00:13:10

Hotchkiss:

Not that I know of. There are plenty of younger people, but I don't see them organizing. One of the problems is that there's a network of nonprofits running most disability services that's become kind of monopolistic. It's controlled by one family, and somewhat corrupt—very corrupt, not just somewhat. And that's made it very hard for people with disabilities to become involved in the development of better services.

03-00:13:51

Bonney:

What kind of services do they get? What is—what's there?

03-00:13:56

Hotchkiss:

Not much. One is the provision of wheelchairs, and figuring out who gets on the list, and how long it takes them to get what they need, and whether they have a choice in what they need. The newly disabled people are mostly getting 60-year-old design hospital junk chairs—made in Nicaragua, still, but junk. The people who got their chairs ten to 25 years ago—who got the Nicaraguan original sports chairs—they seem to be the only ones who get new sports chairs when their chairs give out. I met a farmer, for example, on a recent trip who was visiting Managua from a very distant northeast mountainous corner of the country to get his third chair. His first two had lasted eight years or so apiece, so he had been riding for a while. He was a big guy—six footer, heavy, strong. He was riding his eight-year-old chair. It was still working just fine, but you could see that it was needing more and more maintenance, and spokes, and bearings, and bent rims, and a few other things that happened to it. So it was time to get another, and to have that as his backup chair. And he said, "Well, the first chair, I still use for parts."

03-00:15:35

Bonney:

So, I'm not clear on why it is he'd get a wheelchair when he needs it.

03-00:15:38

Hotchkiss:

Because he's a member of this organization of disabled people, because he set a precedent of "This is the chair I need. I'm fully employed. If I don't get another like it, I can't be employed as a farmer." He can't function with an indoor... And he's connected, because he's been around.

03-00:16:13

Bonney:

So, someone else, who is not in the organization or connected, may get a wheelchair through the services. Do they ever get a second one, or is there —

03-00:16:25

Hotchkiss:

They might get a second one, but it'll be just like the first one—it won't be adequate. Probably costs the government more, because they'll need that second one fairly soon. The farmer gets what we call the "heavy duty model." His chair is just a tank for strength, though it's not that heavy. Forty pound, very well engineered piece of heavy-duty equipment. He is not having structural failures, whereas the folks who get these old style hospital boxes—the stresses aren't well handled. A triangle is stronger than a box. The old Nicaraguan chairs are all triangular on the side frame. They handle stresses very well, like a bicycle.

03-00:17:20

Bonney:

How many wheelchairs are needed, do you think?

03-00:17:23

Hotchkiss:

Worldwide?

03-00:17:23

Bonney:

In the Third World countries, yeah.

03-00:17:25

Hotchkiss:

We used to say 20 million—25 million people—I'm sorry, is that right? Yeah. 25 million people need wheelchairs. That was an old number we used. That was based on a population of 5 billion. One in two hundred Americans uses a wheelchair. So those are fairly old figures. It's probably up from that, now. In fact, in Britain, it's said to be twice that—one in 100 British people uses a wheelchair today. That's perhaps because of a longer history of free wheelchairs. People who need them a little less still have one when they need it. So people, for example, who walk with difficulty. Here, they would just continue walking with difficulty. If they have a bruise, or a sprain, or any medical setback, they still have to struggle. Whereas there, they use their chair for a little while, and go back to walking when they're feeling better. In any case, based on that one in 200, now it would be 30 million people need wheelchairs, because population's gone up to 6 billion since our project started. Of those, 5 billion live in developing countries, so that's 25 million chairs are needed in developing countries. Maybe a bit higher—I wouldn't expect it to be any lower. Every time limited samples have been taken of

people in developing countries, the numbers come out about like the U.S. We have a lot less polio here, but we have a lot more surviving folks with spinal cord injury. Those things tend to balance each other out. I assume the country with the best medical care will be the one with the greatest need for wheelchairs. We'll see how that goes in the future.

03-00:19:43

Bonney:

Well, you know, it seems like a very slow process for individuals to make their own chairs, or for these small wheelchair companies—the groups of people that get together—to try to answer a 25 million chair need. What can be done in the future to increase production in these countries, or someplace else, and get the chairs to the people who need them?

03-00:20:13

Hotchkiss:

A lot of things need to be done, and if only parts of it are done, then those parts will be far less effective. For example, you can give wheelchairs today to everybody, if somebody had the money. That would solve the problem for everybody for maybe three months, for half the people for a couple of years, and after a couple of years, you'd then need another 12 1/2 million chairs, because the kind of chairs that are available today in very large quantities have a very short life. There are copies of the 1950 style Everest & Jennings being made in China today for about \$40 apiece, provided they're bought in quantity. That was the same chair I rode half a block in 1966 and totaled, basically. It was beyond repair, so said the manufacturer. So, they gave me a new one under warrantee. But that one didn't last, either. I ended up keeping the first one and using it for parts, and that was the only way to keep the other running. So, if chairs are distributed—any kind of chairs—a local repair service is needed.

The most widely available similar or related repair service is bicycle repair. If the chairs are designed well, using as many bicycle parts as possible, then it's a natural to do the repairs in bicycle shops. We've begun to do that in Nicaragua. We've done trainings over the past few years of mechanics from about a dozen bicycle shops around the country. Those individuals now have a good background in wheelchair repair. We're also trying to advance the design of our chairs, to bring them up to the state of the bicycle of 1980 [correct date?]. Once we reach that point, we'll have a repairable vehicle. Wheelchairs aren't close yet. Wheelchairs use sealed bearing sets—or so-called precision bearing sets—which—well, first, almost every manufacturer in the world undersizes their wheelchair bearings. The bearings are such that when you whack into the curb, you are stressing that bearing by 50 per cent, 100 per cent over its load rating. That's where bearings fail. The other reason our bearings fail is that the precision bearing sets are very dirt-sensitive. Dirt gets into those bearings, and it's stuck in there. It just goes around and around and around, and the grains of sand grind up the ball bearings. The bearings are destroyed.

To buy a new set of bearings for your wheelchair, \$50 just for the parts, if you buy them in a developing country, where they're cheaper than here—still \$50. That's why all over Central America, I see people riding chairs that have all 12 bearings ruined, or at least have half of them ruined. Typically the ones in the front wheels go first, and the caster swivels, and the caster wheels. That's eight out of the 12 bearings. When the bearings go bad, they just have to keep rolling. Well, they end up destroying a lot of the rest of their chair as a result. The caster barrels, the axles, the hubs all get ruined by rolling on dead bearings. And so—again—it's a long answer, but there are so many things that need to be done before we can expect to have a viable and sustainable infrastructure to support the chairs in the field, all over the world, as well as a chair that's worth fixing.

So, bicycle bearings of the designs from the 1980s are much less dirt sensitive. When dirt gets into a—for example, the bottom bracket, the pedal bearings of a bicycle. Those are open balls, rolling in an open cage. It's adjustable. You can tighten and loosen it, so when they wear a little bit, it's not going to just be wobbly. You can tighten it up a bit, and run fine for another 20,000 miles. If they get full of dirt—in places like Uganda and Nicaragua, I work with bicycle mechanics, and when a bike comes in that's been used by a farmer through the monsoon seasons for several years, those pedal bearings will have gotten lots of dirt into their tube—the tube in which they're mounted—but when you take them apart, they may be totally packed with hardened mud, but there's a clean stripe around in the bearing race, where the balls have rolled—the balls have plowed the dirt aside, and gone around, and show some wear, but usually are in pretty good shape, even if they haven't been oiled. And if they do oil them, you can oil bicycle pedal bearings for years, even when they're full of dirt. And they run quite well.

So, we're switching all our chairs over to that kind of bearing. Then, instead of buying—if they do wear out, when they do wear out—which will be at some point much later—then, instead of going and buying \$50 worth of parts—an impossible task for most riders—you can go down to the bike shop, which is within a couple of blocks of almost anywhere in any village anywhere in the world—whereas the seal bearings come from the big cities, from the Toyota dealers—and you can buy a little handful of balls—just the balls—rebuild your bearings, readjust them, pack them with grease. Total cost under a dollar. So, quite possible.

So when we have chairs that are worth fixing, and that are easy to fix by the bicycle mechanics, and when the bicycle [mechanics] are trained in some of the tricks, like aligning the rear wheels, so they both go in the same direction if the frame gets bent out of shape—that slows us down more than almost anything else. If they learn how to set the front casters, so that they don't pull the chair to the left or the right, so that if that gets bent out of shape—say somebody drops the chair while they're getting it off the roof of the bus, lands on the front caster, bends it a bit—it's easier for a good mechanic to learn how

to realign that caster and get that chair rolling straight again. If the chair doesn't roll straight, a person will be dragging one hand, pushing with the other, just to go on a straight line on a flat floor. Slows you way down. Brings on arm and shoulder problems much more quickly, and certainly worth repairing those things. In this country, we usually buy a new chair when they get that bad.

03-00:28:40

Bonney:

Is there any talk with bicycle companies to build certain parts to go on wheelchairs, specifically for wheelchairs?

03-00:28:50

Hotchkiss:

There hasn't been. The United States bicycle industry—like the wheelchair industry—has deviated from sustainable design. American bicycles now—bicycles sold in this country, they're mostly not made in this country any more—the higher tech bikes have higher tech bearings, now. They're changing their designs in ways that are too expensive, and changing to designs for which the parts are not available in developing countries. But I don't think there's a problem there. I think that the bicycle infrastructure in the developing world is so good now that we don't need to make any special deals. I think that all we need to do is figure out how to use the stuff that they're already providing us.

For example, all the ball bearings for a wheelchair, if you use the bicycle bearing sets—under a dollar. All the other bearing parts—just a few dollars for a wheelchair. Much cheaper than buying this \$50 retail price—or the manufacturer might pay \$20 for all the seal bearings to go into a wheelchair, buying them, of course, wholesale in quantity. If they make the chairs with those parts, the repair is so much cheaper, so much simpler, and so much less frequently needed that I don't think there's any way we could get parts into any of these countries as cheaply as the bicycle industry already is doing. You can buy a whole pedal set, with the shaft, with the bearings, for about two dollars in most countries in the world. The same parts in the United States would cost us \$15, approximately. Typical retail price. It's a competitive industry, it's working very well. We just need to tap into it.

03-00:31:34

Bonney:

Let me ask you something else. There are a number of American and European countries that send wheelchairs to developing countries, and one of them here in California is the Wheelchair Foundation, Ken Behring's group in—I think—Danville. And there are other ones across the world. What are your thoughts on what they do for developing countries? Is it helpful for them to send these wheelchairs, or is there something else that they could be doing to make it a better gift—so to speak—to a country?

03-00:32:16

Hotchkiss:

They're off to a great start, and they've made a huge change in people's perception of the problem of wheeled mobility in developing countries by

showing that it's a problem that can be solved, and convincing a lot of people to become involved in trying to do so. Now, they need to learn how to do it, and do it in an effective and sustainable way. They are providing the same chair I got in 1966, the one that lasted half a block. That chair's made in China. It's an exact copy, all the mistakes included, and it's not repairable. It has bearing sizes that can't be bought, it has parts that fail prematurely almost everywhere. They've been so successful in spreading those chairs around that virtually everywhere I go, I get begged to fix up to dozens of chairs in a given location that cannot be repaired.

03-00:33:29

Bonney:

So, what could these foundations do that would be more useful?

03-00:33:33

Hotchkiss:

They could continue doing what they're doing, and doing very well—purchasing and giving away chairs in large, large numbers. But they could do so with chairs that could be repaired locally, and chairs that are safe to ride, and that are strong, and that will work both indoors and outdoors.

03-00:33:56

Bonney:

So, they could give a better quality chair? Is that what you're saying?

03-00:33:59

Hotchkiss:

Much better quality, and much better design. Both.

03-00:34:01

Bonney:

And those are available.

03-00:34:03

Hotchkiss:

Those are available. They need to have the patience to work with people like us to get these designs made. I would be happiest if they wouldn't buy them all in China, or all in any large, centralized manufacturing site, though buying some of the chairs in these large sites would be the most efficient way to solve the problem quickly, no question. But to have more regional, medium-scale manufacturers plus local, small-scale manufacturers—all competing, all at comparable prices—to set up an industry like the bicycle industry. I mean, the bicycle industry—within 100 miles of Delhi, there are 10,000 brands of bicycles available, each one made in its own factory. They're all competing, at a price of between \$40 and \$50 today, for an adult-sized industrial strength bicycle. Great bicycles. Big 28 inch wheels, real off-road cruisers.

If we can emulate the structure of that industry, to some extent—we'll never have the volume they have, but certainly if we have smaller places spread around, there will be good repair sites, they'll be able to handle things that the bicycle repair people can't do, like frame reconstruction or frame modification. They can take some of the chairs from the big importers and adjust them, which might mean cutting, bending, and welding to meet people's individual disability needs. You could never, for example, get a chair to fit your leg length from one of these big manufacturers. They're just not only the

list of standard chairs. But a local shop could do some chopping and welding, and fit you just fine. Probably better than you're used to being fit, even here.

03-00:36:18

Bonney: If these foundations sent over better chairs—the stronger, better chairs you're talking about—would they have to be repaired as much?

03-00:36:31

Hotchkiss: No, they'd need far less repair. But everything needs some repair someday.

03-00:36:34

Bonney: Right, but that would help.

03-00:36:36

Hotchkiss: Even a Toyota needs repair.

03-00:36:37

Bonney: Right. OK. I asked you this question yesterday, after we were done taping, but I'm going to ask you now. Since you know how to build a wheelchair probably for \$200 or thereabouts with your old kind of parts and manufactured things that go on in your little shops—

03-00:36:58

Hotchkiss: Or as little as \$110 in Vietnam.

03-00:37:01

Bonney: OK. Why not build chairs and sell them to people in this country for cheaper?

03-00:37:12

Hotchkiss: I'll leave that to somebody else to do. We have plenty of great chairs in this country. There's been a revolution in chair design. Our chairs have gotten better, and they're half the price they were 25 years ago. The industry is still somewhat competitive. It was monopoly controlled until the eighties, but competition took off after the anti-trust settlement with the Justice Department, and things got much better, and we're all benefiting from that. Eventually, there will be more trickle up from developing countries. There's some interest—for example—in our Zimbabwe front wheel—our three inch wide, extra soft front where that sails through the sand, and over cracked sidewalks or rocks very well, and the Americans can come get it if they want it. It's for sale all over the world, now.

03-00:38:26

Bonney: A slightly different focus on wheelchairs—what I've heard you talk about so far are men building wheelchairs, and needing the chairs, and being in the rehab hospitals —

03-00:38:36

Hotchkiss: Men and women.

03-00:38:38

Bonney:

I was going to ask you about women. Are women making and designing wheelchairs? And if so, are they different from a man's wheelchair? Do they have different ideas about wheelchairs?

03-00:38:52

Hotchkiss:

We've had women mechanics integrally involved in the design of the Whirlwind from the very beginning. One of the three mechanics who started out the shop in Managua in 1981 was a woman. She initially was the seamstress—she came from that background—and she designed and sewed all of our fabric, but from the day she entered the shop, she was basically telling us what to do in everything else, and convincing us that—for example—we needed a triangular side frame, that simple was OK—we didn't need a big square armrest up here. We could get rid of it. If somebody needed a little armrest, that should be the add-on. We should make the chair as light as possible. That's one of the factors that the women have pushed for most is less weight. Kind of reorganizing the priorities in the features we choose, so that the chairs are less cumbersome.

Whereas the guys have tended to want to sit tall, and cruise fast, and strut their stuff through the town, the women have been more interested in doing the work with the chair, and having seats that are low enough that they can reach the floor, and not having anything in the way of reaching the floor, and one of our—pretty much unsolved—problems that the women have been pushing for in Uganda, Kenya, other places, India is getting up and down from the floor to the chair. In societies where the cooking is done within ten inches of the floor, it's pretty hard to work from a wheelchair.

We had what was called the jump seat on our chairs in Kenya—a few are still made—where it was first developed by a woman wheelchair builder—head of one of the shops—who had a three-year-old daughter when she started making chairs, and she needed a place for her daughter to ride. But also her daughter and other kids would always be cared for on the floor. They'd roll out the straw mats, and that would be the kids' place. So, we made a little second seat, just ahead of the front seat, so you could jump down—it was halfway down to the ground. It was above the footrest and below the seat. And that had the great advantage not only of making it easy to get down to cook and care for children, but in the outhouse—they have no seats in outhouses in East Africa, pretty much. They just have a hole in the ground. So, this second seat had a trap door in it. It was made out of fabric. You could pull it open, and sit on the seat, and take a shower with the bucket and the cup—classic African morning shower. Worked very, very well.

Unfortunately, our new chair with the longer wheelbase—more stable—the whole chair is also shorter than it used to be, because we don't have footrests way out ahead of the front swiveling casters. There's no room for the jump seat anymore. We need to make a flip-out jump seat, or something. Maybe

like the American luggage racks. There would be a little trickle-down of technology, if we followed that design.

Fatuma [?] who's head of the women-run shop in Kampala, Uganda, was here a couple of years ago in our classes at San Francisco State. We took whole class periods just trying to work on this "How do I get down and get back up?" problem. Her disability was polio. She's very strong, but fairly heavy, as well. She has six children, including a deaf daughter. Until she started doing better, she was also a single mother. When she started making money with her wheelchair shop, the men flocked around. We never solved that problem. We got some things that were close—she could almost get back up, and get down. Because, of course, now where we put the armrests, whether we had extra armrests out from the chair—even—I can't get up from the floor. Maybe give me half an hour, and I can get up with some bumps and bruises, but that's not practical. I can get up if I have another chair nearby. I've pretty much given up on the problem for myself, for the moment. But these women are still pushing, and I'm going to have to get back into it. I hope somebody comes up with the beginning of a new family of solutions. As it is now, I go from the floor to my footrests. That raises me just a few inches. That's a start. But then, to go from there to the seat, I have to have something nearby to lift on. It can be the back wall of an outhouse, if it's rough enough.

03-00:45:15

Bonney: So you can grab onto it.

03-00:45:17

Hotchkiss: Yep.

03-00:45:20

Bonney: I was reading some things about women and chairs, and it was talking about how—you mentioned—they wanted to cook, and get down on the floor. I mean, that's where the family sort of lives, and congregates, so if you're up here and they're down here, you're not part of the family very much.

03-00:45:35

Hotchkiss: There's something very comfortable about sitting in a circle on the floor with the bowls of soup.

03-00:45:42

Bonney: Yeah. I read also that they wanted chairs that would accommodate them doing the gardening, because they're the ones that do the growing of most of the food.

03-00:45:54

Hotchkiss: That's where our project started. Appropriate Technology International was working with vegetable farmers in Guatemala with disabilities, and that's the 1980—that was the aspect of our project that interested Appropriate Technology International.

03-00:46:16

Bonney: Where is Appropriate Technology International located?

03-00:46:19

Hotchkiss: Now it's called EnterpriseWorks, and it's in Washington, DC

03-00:46:23

Bonney: OK. So, it's a private, nonprofit group? Or what is it?

03-00:46:30

Hotchkiss: It's a nonprofit. It was created by an act of Congress. E.F. Schumacher-related Small is Beautiful—we talked about that. They're working mostly in Africa now. They were working more in Latin America when I was working with them in the early eighties, and they do mostly farming-related work. Cook stoves, they do a lot of work with, as well. High efficiency cook stoves. The Jiko, an East African cook stove that's a metal pot lined with thick clay, so as to keep it really hot—make it more efficient by burning at a higher temperature. That was a project that they worked on for 25 years. First came from Bangladesh, and they developed it further in Africa. Now it's made by the millions every year. They cost about a dollar a piece.

03-00:47:41

Bonney: The other thing I think you're working on is a wheelchair designed for a child?

03-00:47:47

Hotchkiss: Yes.

03-00:47:47

Bonney: Where were you doing that, then? Tell me about —

03-00:47:49

Hotchkiss: We've done kids' chairs all along, but we're trying to get more formal about it, and document what we have done, so that we can pass it on to other groups. We're doing it in Colombia now, and in the U.S. We've tried to make our kids' chairs—early on, kids' chairs were just shrunken adults' chairs, which is a great way to do it, I think. Historically, kids' chairs have just been narrower adults' chairs, but they're still very high, and quite heavy. They're designed for the convenience of the caretaker, so they don't have to bend over so far to pick up the kid. But the kids don't like them so much, because they can't play that easily with other preschoolers. We built one when my son was in preschool for one of his classmates, who had a spinal cord injury. His was only three inches off the ground. He would sit on this thing—it was a low rider, had little 12 inch wheels, and he'd scoot around just skimming the grass. It worked very well, except that he almost never got the wheelchair, because the other kids always had it.

03-00:49:11

Bonney: More like a scooter, or a little platform for a —

03-00:49:15

Hotchkiss:

It was fun. Now, we're looking at kids a little older than that three-year-old—say, age four to twelve, that range. We're trying to make a chair so adjustable that a typical kid can be at least fairly comfortable in the same chair from four to twelve. In this country—thank goodness—we now have really little chairs available for preschoolers, and different sizes all the way up. But between preschool and junior high, kids will go through two or three chairs. If the situation is such that the kid is lucky to ever get one chair—because kids haven't had chairs yet, pretty much, in most of the world—than better we give them one that can serve for the longest possible period of time and still be fairly propellable, fairly quick. So we've given it a lot more footrest adjustment. Footrest adjustment is more diagonal—away from the seat—than up and down, so that as their thighs get longer, everything grows at once. We had an adjustable seat width. We have pretty much a high back, for the convenience of the caregiver.

03-00:50:47

Bonney:

To push it, you mean. So they can push.

03-00:50:48

Hotchkiss:

To push it. A short kid can be fit in a high back fairly well, if it's well designed and doesn't get in the way. A couple of other adjustments that help. A lot of changes have gone into that chair to make it more comfortable for kids in a widely varying size range. We're right now testing it, if you know of any kids between four and 12 who are experienced wheelchair riders, we're looking for kids to test it right now.

03-00:51:25

Bonney:

And are you doing this work in this country, or —

03-00:51:28

Hotchkiss:

San Francisco State.

03-00:51:29

Bonney:

Oh, at San —

03-00:51:29

Hotchkiss:

But also in Colombia. A good number have been made down in Colombia by the same shop that made the chair I'm riding right now, and those are being tested in the field. They have some experienced rehab people following the kids and getting their feedback, fixing the chairs when and if something happens. Also helping the kids with the adjustments, and teaching us about when they have difficulty with the adjustments—where we need to work on making the adjustments easier, simpler. It's going very well. We've been working on it for a few years now, and we're at the point where we're pretty much ready to give it to other groups and try it out in more places, see how it goes.

03-00:52:21

Bonney:

Are you trying to design a chair that can be easily replicated in Third World countries?

03-00:52:27

Hotchkiss:

Always. All of our chairs are like that. If it has to be imported, it's not going to get there, pretty much. Unless it's a \$40 one that's easily available today from China. That's the one example of a chair that did get there in large numbers, even though it had to be imported. But we kind of feel that if the smallest manufacturers can make it at a competitive price, then the big ones can, too. We like to start small and grow from there. Because the small shops are the ones that are going to service the consumers, even if they're only serving as dealers and repair centers eventually. Even if they have to scale back, because the big shops can beat their prices, that's still OK, because small shops will have plenty to do once everybody has wheelchairs. Just think of how much work there will be to do. Look at the waiting lines at Wheelchairs of Berkeley. A repair shop that started out as a fabricator is going to be a great repair shop. A repair shop that started out just replacing parts—not necessarily going to understand the tradeoffs in wheelchair design for different people, not necessarily going to understand how to cut, bend, and modify a chair to fit somebody much better.

03-00:54:10

Bonney:

Do you have patents on your designs?

03-00:54:12

Hotchkiss:

We put things in the public domain. We publish them, and one year after publication, nobody can patent it. It becomes public property.

03-00:54:22

Bonney:

So, you're putting it in the public domain —

03-00:54:25

Hotchkiss:

Yes.

03-00:54:25

Bonney:

— just to spread the word about people —

03-00:54:28

Hotchkiss:

And to prevent anybody from monopolizing the ideas at any time.

03-00:54:36

Bonney:

So that a company doesn't—after a year's time, or during that first year, you mean—go off and patent something that you've designed, and then make it from then on as [inaudible] —

03-00:54:46

Hotchkiss:

Right. Or even if they invent it again on their own. We want as much technology to be in the public domain as possible, because we want progress. That's my vested interest, is better chairs—for me, among other people. I

haven't seen the patent system be too much help in the wheelchair industry. It was instrumental in the creation of the 30-year monopoly of the Everest & Jennings wheelchair, and that's an example of the problems of the patent system, especially in an area where you have captive consumers, where the user is not necessarily the purchaser—doesn't choose the chair—where we don't have good consumer control. It's just inherent. We don't have it.

Add to that patents. Everest & Jennings' basic patent expired in 1953, but by then they had the 95per cent monopoly, and then they resorted to other means to maintain that monopoly. If the market place had stayed more competitive, if the dozen other manufacturers from the thirties and forties had been able to stay in business—if they hadn't been beaten down by patent infringement lawsuits by Everest & Jennings, among other things, then we probably would have kept a competitive market place, kept lower prices, and seen designs continue to progress. But as it was, we went into a 30-year period in which there was very little progress, and in some cases—like the fork design—there was backwards progress. Things got worse, things got weaker, as they got cheaper.

03-00:56:42

Bonney: OK. Let's stop here.

[Begin Audiofile 4]

04-00:00:00

Bonney: OK. This is Ralf Hotchkiss, interview two, and this is tape four. Ralf, when I was doing research on you, I came across a reference to the fact that in—I think—1998, you were in Kenya when the American embassy was bombed. Can you tell me why you were there, what you were doing, and what you saw?

04-00:00:29

Hotchkiss: The day after the embassy explosion, we had an all-Africa conference of wheelchair builders, in the mountains above Nairobi, about—probably 50 miles, 60 miles from Nairobi. Our team of five Americans, with our five Kenyans who were working with us, were all in three buildings right across the street from the embassy—directly across the street. Heard an explosion outside, thought it was a truck collision—small explosion, but would have been a hell of a truck collision. I was curious, so I lifted up to look out the window. All of a sudden, there was an explosion like thing I've ever imagined, and the whole wall of glass came into the room. The interior doors were blown out of their frames inside the building. The ceilings came in inside our building, and the destruction was horrendous, even in our building, which wasn't the bombed one, and we were on the opposite site of the embassy from the bomb itself. So, the building that had the most damage was the 20 story building on the opposite side of the embassy from us. That whole building was gutted—all 20 stories lost their walls, ceilings, everything just stripped.

Just the metal frame was left, pretty much. Luckily, none of us were hurt badly. Certainly not enough to bother any medical facilities—

04-00:02:42

Bonney: Wow. You're lucky.

04-00:02:43

Hotchkiss: Not that we could have gotten in, anyway. Yeah, scratches, and bruises, and so forth—but that was it. We all got together—congregated at one building. We eventually found each other. In the process of trying to get together, we saw so much injury, so much human destruction, so much horror, so many people with impending blindness from the flash in the glass. A lot of glass cuts in the faces. A lot of broken eyes.

We thought it was war—like, a rocket had landed, or something. A guided missile, something like that. So, we figured the best thing we can do is just go hide. Don't go to the airport—that'll be the worst place to go. Don't try to get out of the country, just go to our conference site, which was very well hidden away, and which was in a mono-tribal area of the largest tribe in Kenya. It was pretty much central in that area, so if tribal wars broke out in the middle of what seemed to be started, we would probably not be caught up in them. It seemed like the safest place to go. We eventually found a taxi, and a lot of us piled into it—just people on top of people—and we rode out of town. The whole way out of town, both sides of all the streets were just lined with people in silence, just watching. There was almost no car traffic, and our taxi would roll by, and everybody would just be looking, wondering what —

04-00:05:14

Bonney: So, at that point, they didn't know what had gone on, or what was happening?

04-00:05:16

Hotchkiss: Nobody knew what was going on. Some of our friends were killed. A guy begging on the street, who was one of the active members of the activist disabled community. He wasn't begging, he was selling pencils. I shouldn't—on the other hand, some of the people begging that I do know are some of the proudest people I've met, because society expects them to do nothing—to just fade away and disappear. Out of sight, out of mind. And a lot of families carry that out for society. They hide the people with disabilities in the back of the house. Even neighbors won't know there's some disabled person living next door. Or, if they do know, they don't talk about it. Here are people who are raising families, and paying the fees to send them to school by begging out in the street. They're doing a quantum leap in the advancement of their families, and doing what they're not supposed to do. They're being real rebels by begging, by getting right out there, by showing their disabilities, not hiding them. Most of the ones who are begging are also selling pencils, are also selling lunch, are also doing something—flowers. There's a huge informal economy of disabled folks around Nairobi. They're supplying each other with goods, and helping each other best spend the money they make. They all

know each other, and everybody's got their spot, and their turf. Some of the better developed ones have kiosks in the marketplaces. These little cubes that fold up and lock up, open up and become a whole store.

04-00:07:31

Bonney: So, when you got up to the conference place, what did you do?

04-00:07:37

Hotchkiss: Well, we figured, "Too bad, no more all-Africa conference." We still didn't know what was happening war-wise, or whatever it was. That was the day before the conference. Almost all of the people coming from all around Africa hadn't left yet. They all saw this on the news, and they were coming either by air or by—most of them by bus, country to country to country by bus. A few by train. The next day, they all arrived. They did not care what the warmongers were up to. They intended to come to this conference, and they arrived carrying all of their—not only their own chairs, but their extra wheelchairs, to show what they were building. Tricycles, and all kinds of neat stuff. The only ones who didn't make it to the conference were a few Americans who got stopped in Frankfurt.

04-00:08:49

Bonney: By?

04-00:08:50

Hotchkiss: By the news. They might have continued. They still could have gotten in—as far as I know, air traffic never stopped to Nairobi, though some of the planes came with very few people, obviously.

04-00:09:06

Bonney: That's probably more people—Americans—who were afraid to be there than anything else.

04-00:09:11

Hotchkiss: And Americans were strongly advised by the State Department not to continue, not to go—for good reason.

04-00:09:25

Bonney: How did you feel about your own safety, being an American?

04-00:09:29

Hotchkiss: I've never felt bad about my safety as an American, because I've yet to be in a country where they confused us with our leaders, and even when our leaders do things that are reprehensible, most of the people in the world are used to governments like ours, that do things that are not in the best interest of the—who sacrifice their own people for the ends of the governors, of the commanders. When that happens, they don't blame it on us. They blame it on the powers that are. So, yeah. There are some places I'm not anxious to go at the moment, just because people—having seen, for example, that we reelected Bush—are figuring, "Well, maybe that is what Americans really like."

04-00:10:36
Bonney: Where don't you want to go right now?

04-00:10:38
Hotchkiss: Iraq. I'd be happy to go to Iran at the moment, but I don't know if that will— I'm sure that there will be some people I'd want to—I think I'd lay low if I was there. I've been to Afghanistan, a year and a half ago, and I wasn't happy to be there. It was the tensest situation I've ever been in.

04-00:11:04
Bonney: In terms of?

04-00:11:06
Hotchkiss: I had to stay within about a two-block area.

04-00:11:16
Bonney: OK. We are back. You were talking about being in —

04-00:11:30
Hotchkiss: Afghanistan.

04-00:11:30
Bonney: — Afghanistan, and having to stay within a two-block area.

04-00:11:34
Hotchkiss: I had to stay within sight of a guard in a tower, with a sniper's rifle, and a machine gun, and I don't know what else, up there.

04-00:11:46
Bonney: What city were you in?

04-00:11:48
Hotchkiss: Kabul. He was watching everything in the area. I had to stay within sight of him, just in case.

04-00:12:02
Bonney: Now, was he an Afghan soldier, or —

04-00:12:04
Hotchkiss: He was a private guard. He was hired by the hotel where I was staying, and he was assigned to watch me —

04-00:12:14
Bonney: Oh, just to watch you —

04-00:12:15
Hotchkiss: Well, as well as the hotel compound. Often, there were two fellows up in the tower. He said that he would be keeping an eye on me all the way to the shop, where I was working on wheelchairs.

04-00:12:32
Bonney: And was that to protect you—

04-00:12:34

Hotchkiss: That was to protect me.

04-00:12:34

Bonney: — or was that to make sure you were doing what he wanted you to do, and —

04-00:12:37

Hotchkiss: No. He was hired to protect. I don't know what he would have done—try to shoot somebody who was—from two blocks away. That's quite a distance. But he said, "Oh, no. That's not a problem. We have extreme accuracy."

04-00:12:56

Bonney: [laughter] Let's hope so, right? He's aiming it at you.

04-00:13:00

Hotchkiss: Within feet or inches of me, yeah. I met some very, very interesting disabled folks, sometimes coming in with a gaggle of kids, because the disabled person—man or woman—is the one who takes care of the kids while the other one goes out and works. That's true everywhere.

04-00:13:22

Bonney: Now, what were you there for? What was the —

04-00:13:25

Hotchkiss: It was to receive 100 chairs that we had had made in India—100 of an adjustable width Rough Rider model. Adjustable width, because we didn't know what size the people would be in Afghanistan. You know, each individual would be different. So we made one that could be fit to them on site, and I was working with CIR—Center for International Rehabilitation, in Chicago—and they were setting up a team of Afghan physical therapists, occupational therapists, and disabled folks, who were going to fit these chairs to 100 people, 100 local people, whom they had chosen, and then adjust the chairs to size, then follow them up, doing repairs if necessary, and writing down a lot of information about how the chairs were doing, and what the real needs are in Afghanistan, so that we could do a better job next time.

04-00:14:46

Bonney: Was this your first trip there? Your first time there?

04-00:14:48

Hotchkiss: First time. Yeah.

04-00:14:51

Bonney: How are the chairs doing? Do you know?

04-00:14:51

Hotchkiss: They're doing pretty well. There are some problems—it's the roughest place I've ever been. I haven't been on the moon yet, but this might be rougher. It's an amazing country for just rockiness.

04-00:15:06

Bonney: No paved streets?

04-00:15:08

Hotchkiss: There were some in Kabul, but nowhere where I was going, because that was on the edge of Kabul, and out in the countryside, I didn't really see—but I could see with binoculars. Roads were going up the mountainside, and you could see an occasional vehicle by their plume of dust. Yeah, it was just barren. Nothing living—only where it was irrigated down in the river valley, a little bit. Old Soviet tanks and other equipment all over the place, wrecked and burned—the remains of them.

04-00:15:54

Bonney: Still there?

04-00:15:55

Hotchkiss: Still there. The thing that frustrated me most being there was getting to know some of these folks—the same folks coming in for their chairs, or a couple of them who worked in the prosthetics center where we were doing the assembly of the wheelchairs. They kept inviting me to their houses—I wasn't allowed to go. Not even close to being allowed to go. It wasn't even an option, because of security. Because there were so many people, basically, interspersed within in the community, who were at war with Americans, but not working in groups, working person to person, door to door. So, I wasn't happy there.

04-00:16:52

Bonney: You mentioned when you were in Nairobi that you went with five people. Who else was there?

04-00:16:58

Hotchkiss: Peter Pfaelzer, Jan Sing, Jenny Kern, and Curt Kornbluth.

04-00:17:14

Bonney: Are they all from around here?

04-00:17:15

Hotchkiss: They're all from the Bay Area. You know Jenny.

04-00:17:20

Bonney: And who was the first person? Oh, Peter Pfaelzer?

04-00:17:25

Hotchkiss: Yeah. He was our principal investigator [PI] at San Francisco State. He's the one who brought our project into State, when he was head of Mechanical Engineering.

04-00:17:38

Bonney: OK. Well, let's talk about your stint at San Francisco State. How did you connect up with them? How did you get there?

04-00:17:49

Hotchkiss: Good luck.

04-00:17:51

Bonney: Really?

04-00:17:52

Hotchkiss: I was—first about 23 years ago—visiting Peter's design classes regularly. He would always have something having to do with disability.

04-00:18:06

Bonney: And he was at San Francisco State, at that time?

04-00:18:08

Hotchkiss: Yes. He was head of Mechanical Engineering.

04-00:18:10

Bonney: So, he's a professor.

04-00:18:10

Hotchkiss: Joyce—her last name? Hackenberg, or Hacken—I'm missing her name. [Joyce Hackerberger] She's a local woman, scooter rider, who has a business doing educational software for grade school kids. She was a good friend of Peter, and he had several projects related to things that she needed that had never been on the market. Then, twenty years ago, they had the opportunity to write a proposal to HHS [United States Department of Health and Human Services] for the creation of a training program in rehabilitation technology for rehab counselors. They had a big rehab counseling school there. Alice Nemon was the one in the counseling school, who—N-E-M-O-N—who was writing that proposal, and she wanted to write it with Peter, who was in engineering—have an interdepartmental project. Peter was gone, so I ended up writing the proposal with her, and we won a big three-year contract, big enough to do a sizable program, which is still going on.

Then, in '89, MacArthur [John D. and Catherine T. MacArthur Foundation grant] came along, and San Francisco State offered me a full-time job there. At that time, I think I was 20 per cent time just working on the rehab project—rehab technology project. So I became full-time there, and I shared a shop with engineering. Engineering didn't have much of a student shop at the time—had very little, almost nothing, which is astounding to me. More three-year rotations among the faculty than practical experimenters, and so I set up a shop—pretty much brought stuff from home, and set up a parallel shop at State. Brought the machinery from my shop at home. Since then—what, 18 years—I've shared that shop with engineering students. They build bridges, build human-powered vehicles, lots of mechanical and civil engineering projects, and simultaneously, we're working on wheelchairs.

04-00:21:23

Bonney: So, when you say "we" are working on wheelchairs, what—

04-00:21:25
Hotchkiss:

Whirlwind. Whirlwind is.

04-00:21:27
Bonney:

OK. Tell me, what is Whirlwind?

04-00:21:30
Hotchkiss:

Whirlwind is a project of San Francisco State University, now part of the Institute for Civil and Community Engagement—ICCE, which used to be the Urban Institute. Before the Urban Institute, we were a part of the engineering department, but when Peter retired—what is that, about five years ago?—I had trouble finding another P.I., and had trouble becoming one myself, not being a tenure track faculty, at all. So, that's how we got under ICCE. But the President's office carried our project—covered my salary for the first 11 years, and that made it amazingly easy to build a program, because we could work otherwise on totally soft money, and when we would have gaps in our funding, we could keep working. I still had a salary. I didn't have to go scrounging elsewhere too much. Other people, we'd pay them when we could, but we mostly had a base of volunteers, who were graduates of our wheelchair course, who would get paid for trips overseas once in a while, when we had them—when we had them funded—but who usually had a day job here, had some other career. It worked very well. The last six years—since we've had to raise all of our own funding—have been considerably more difficult, because slumps in funding can be devastating. We get very hard to keep people on board. We also have gotten bigger. We have more people on salary than we did in the middle eighties, middle nineties. We have five of us.

04-00:23:49
Bonney:

And why did the funding go away six years ago?

04-00:23:51
Hotchkiss:

The President's Office was carrying it just as a—it was like seed money, to get us going, and yes, we got going. We got big enough to just barely be able to be self-sustaining. But self-sustaining with definite ups and downs. So, Marc [Krizack] and I—he's now our project manager—project director—the two of us have been on half time for a year and a half, because of slumps. It's tricky.

04-00:24:44
Bonney:

Now, what is the project? What are you doing? Is this where you train—people from other countries come here, and get trained, and go back, or—

04-00:24:56
Hotchkiss:

And we have a class that we give every semester. Now it's Tuesday nights, in the evening.

04-00:25:01
Bonney:

OK. Tell me about that.

04-00:25:02

Hotchkiss:

It's called Wheelchair Design and Construction. Each team of students builds a chair from scratch, and—with luck—completes it in a semester, building virtually every part of the chair, from the breaks, to the footrest, to sewing the fabric, cutting, bending, and welding the frame, every little part. We give that course overseas, typically once or twice a year. We have foreign visitors taking the course—San Francisco State has an awful lot of students from other countries. We have a student this semester from Egypt, another from Iran, and so we've trained, now, well over 1,000 people in wheelchair design and construction.

04-00:25:55

Bonney:

But these people who come to that course aren't necessarily all that involved with disability stuff?

04-00:26:02

Hotchkiss:

Some are, some aren't. They vary. The ones who are least involved with disability stuff tend to be the engineering and the industrial design students from State. The ones who are most involved are the wheelchair riders—local or foreign wheelchair riders, who take the course in order to get some background in wheelchair inventing for themselves. A fair number of Bay Area or North American people have taken the course just so that they could experiment with their own chairs, and some of them have ended up working overseas as well. But there are also parents, family members of wheelchair riders from the U.S. Pretty wide mix—from 20 to 70, has been the age range of the students. Average age in their thirties. We're offered through extended ed—anybody can take the course from the community. Students—full-time students or regular students at State—can just take it as a two-unit extra credit sort of course. They can fill in their free hours.

04-00:27:28

Bonney:

Only two units for building a wheelchair? Seems like a lot of work.

04-00:27:33

Hotchkiss:

Yeah. It's a five or six hour course, each evening. Because it's all lab, they only get one unit per three hours.

04-00:27:42

Bonney:

Oh. OK.

04-00:27:47

Hotchkiss:

If I had it lecture and five hours, they could get five units. But this is hands-on.

04-00:27:55

Bonney:

Yeah. What happens to the wheelchairs, once they're made?

04-00:28:00

Hotchkiss:

Most of them get used as samples. They're given to groups of disabled people in developing countries to use to test, to see if they want to build that kind of

chair, to serve as an example to follow when they're learning how to build the chairs, to show around and raise money locally, and raise interest locally when they're just getting started. So they've always got one good chair to work from.

04-00:28:32

Bonney: Between the early 1970s and about—when did you start at SF State with Peter? '86, did you say?

04-00:28:42

Hotchkiss: I first started working—well, going to his classes in—it was '84 or '85. And then I started working part-time in the Rehab Engineering and Technology Program in '87, and then became full-time in '89, with Whirlwind.

04-00:29:03

Bonney: OK. Between the late 1970s, when you came to the Berkeley area, and '86, '87 when you started at San Francisco State, what were you doing in that time period? Were you just designing your own chairs, [inaudible], or what were you doing?

04-00:29:21

Hotchkiss: No. In 1980—trip to Nicaragua, January of 1980—the Third World wheelchair project started, and from then on, that was most of what I did. I did some consulting in other things, just as an engineering consultant, or as a disability consultant, or as a disability designer, but most of my work was working with Third World chair builders, and all of that in the early eighties was with Appropriate Technology International. We wrote a book on wheelchair design, published in 1984, and in Spanish a couple of years later.

04-00:30:07

Bonney: What's the title of the book?

04-00:30:08

Hotchkiss: It's called *Independence Through Mobility*, and it's a fairly comprehensive, 160-page, with I don't know how many hundred drawings and photographs of how to choose tools, how to choose materials, how to set up a shop, how to build a chair, how to balance the books, how to do a business plan, and project—and it's all in 160 pages. It's pretty basic. But it was based on some successes and failures that we had had by then. There was one shop in Paraguay that was the best example that we pulled our numbers from. It was a shop started in '83—'82, '83—with the help of a Peace Corps volunteer. They're still active in the field. He was working with an organization of young disabled folks in Paraguay, and they went to local banks, and looked for a loan. They couldn't raise enough money to start as quickly as they wanted to, so they just took a loan. They got an \$80 - \$100 loan, and they invested it in a very organized fashion. They had a retired industrial engineer sort of fellow—a production person—working with them, and that really made a big difference, because he had plenty of experience with the problems of setting up manufacturing. Within about a year, they were in the black. That was the

fastest kind of sequential development of manufacturing and sales that I've ever seen, unfortunately. But it was a great example.

04-00:32:27

Bonney:

Good. Good. Now, during the time—I guess, the whole time that you've been working on wheelchairs, there are several chairs that have been brought up in the literature. One is the ATI, one is the Torbellino?

04-00:32:42

Hotchkiss:

Torbellino.

04-00:32:43

Bonney:

Torbellino. The other one is the Rough Rider. Are they just progressions of each other, or what are those chairs?

04-00:32:52

Hotchkiss:

They're all more or less different stages. There have been a few others that you didn't hear about because they didn't go as far as those did, but the ATI chair was basically our first chair—the one that was in that book in 1984, and it was a short wheel base S-curve side frame folding chair—about a 35 pound chair—one made out of mild steel, the cheapest possible steel. Sort of restaurant chair tubing, and used seal bearings throughout, which I'm now more and more critical of, as I have seen 25 years of their ineffective history, though at that time, they were a huge improvement, because we were comparing to the old Everest & Jennings bearings, which were kind of a substandard seal bearing. It didn't have a seal. It was made like a seal bearing. And it had a load rating of about a third what the precision ratings had. So it was three times weaker, and that was the bearing that lasted me half a block in the sixties. They were just easy to bust. And they were also of sizes that were unavailable from any other manufacturer. They were not standard sizes at all, so outside of within a block of this one company in the U.S., there was no easy way to get those bearings anywhere in the world.

So, it was an improvement for the time, and it was a pretty good chair, and chairs are still being made like that, and there's a good number of them in Nicaragua that are still running, though they've all got bad bearings by now, after 20-plus years. Then we had one that—that chair later was named the Torbellino in Peru. Torbellino means "whirlwind."

04-00:35:06

Bonney:

So that's where the name comes from. OK.

04-00:35:08

Hotchkiss:

Yeah. Yep. We liked that name, because it's derived from "beautiful bull." *Torobellino*. It's better than the word in English, but we use it in English. So, the generic name became Whirlwind or Torbellino in the middle eighties.

Then in the late eighties, we made chairs that had a different kind of folding frame. It was a horizontal folding frame instead of a vertical X. That was

designed, initially, for Siberia, where they had uniformly narrow elevator doors, many people lived upstairs in apartment buildings—even way out in the middle of nowhere, they'd have an apartment building in the middle of the steppes, and all of those elevator doors were narrower than Russian people riding wheelchairs.

There's no way that we knew of that we could make a chair that would work, that would fit in those elevators. So we put a horizontal folding frame, where you could reach under the seat, fold the chair while you were riding it, squeeze into the elevator, squeeze back out, then reopen it—reopen the chair without getting out of the chair. That one is still being made in Siberia.

But we tried it in Palestine—well, Palestine is a high tech place. The horizontal folding frame was more complex, more parts, more precision needed than the standard X-brace folding frame, and they could make it in Palestine. But things didn't go well in Palestine after a few years, because of all the war going on, all the economic problems, all the blockades of the frontiers. They couldn't get their materials. They couldn't stay in business. They were buying materials from Israel, primarily, and supply was so intermittent that that forced—we had three shops in Palestine: Nablus, Ramallah, and Gaza. All working together—trying to work together—and they made some good chairs, but, oh, it was a struggle.

But then we tried to do that same model in Africa. Of course, there are no elevators in Africa to speak of. They don't have as narrow doors as the Siberian ones anyway, so it's not such a problem. Of course, there are plenty of narrow outhouses in Africa, and so we thought maybe there would be a use for it. But it didn't turn out very well, because the additional difficulty of building that fancy folding frame was not as great as the difficulty of having a little wider chair. Outhouses are easy to modify. Sometimes you can even modify them in the moments before it's too late to get to the bathroom.

04-00:38:11

Bonney:

[laughter] And how do you do that? Did you just push through frame?

04-00:38:15

Hotchkiss:

You get up a little speed. Same thing you do with American public bathroom stalls, but it's not as noisy in Africa. So, that chair—it'll come back, I think. There are situations in which that type of folding frame is definitely advantageous, but for the moment it's on ice, and we're back to the X-brace.

So, our next major model was middle-nineties. We called that Africa-1. It was like the one from Nicaragua from the eighties—the one we did the book about. But simplified a bit, in certain ways, and strengthened in certain ways. But still short wheel base, so it tended to tip forward, but a lot less than the American chairs do, because we lowered the seat and moved the seat back a bit—reclined the seat a bunch. So when it began to tip, you were much less

likely to fall out, and thus the chair wouldn't tip as far, and you'd be safer. So, it was an improved model of the old standard American—basically the 1933 Everest & Jennings patent, or the 1940 patents from other companies. Wide tires. Well, we added the Zimbabwe wheel in the nineties, which was a much wider front wheel, much softer. Nice design that we got from push carts in Zimbabwe. Still my favorite wheel on any chair. And no flat tires. Lasts—we don't know how long it lasts. We've only had it 20 years—or, no, we've only had it 15 years.

04-00:40:06

Bonney:

15? But still going. Still working.

04-00:40:08

Hotchkiss:

Some of the early ones are still running, and they wear down very slowly. Took me a lot of tire retread rubber, and the poorer the country, the more they have to retread their taxi and truck tires, and so the more available that technology is. We just need the molds. We make the molds here, or we make the molds in other countries. So we've got molds in a dozen countries now, turning out those tires.

The more recent chair has been the Rough Rider, and that was designed in Nicaragua about five years ago—the first version of it—and that was taking advantage of the Zimbabwe wheel design, which allows us pretty much to make a wheel as wide as we want. We made a wheel three inches wide, so it's good against falling—it doesn't fall in cracks so easily, it rolls well over sand. Making it extra-wide enables us to make it smaller in diameter. We made it just barely small enough to fit under your toes without raising the knees of a typical height man. Normally, in a regular wheelchair with the footrest way out ahead, you need some ground clearance under the footrest, so they're forever scraping ground and dumping you out.

So we took that same height, raised it just a bit, and then put the—what turned out to be—four inch by three inch wide wheels under the toes. That allowed us—instead of putting the front wheels way behind the footrest—we need so much swiveling space on the caster that the caster, when you're rolling, has to be quite some distance behind the footrest, the center of it. So, very short wheelbase. The wheelchair with a 16-inch wheelbase, [track length?] from rear wheel to front wheel—contact points on the ground—that's so short that it's the equivalent of a Chevrolet that was three stories tall. If you had a Chevrolet that was three stories tall and you touched the breaks, you'd go over forward. But that's what happens with wheelchairs. They're forever falling over forward. It's the biggest source of injury to folks like us in the U.S.

So, with this smaller but much, much wider front wheel that we could actually put under your toes—get away with that without raising your knees much—that allowed us to add about 50 per cent to the track length, and that's just enough so that when you ram into something with the new Rough Rider, you

don't tip forward, you just stop—stop hard. Then, of course, with our 12 degrees of tilt on the seat—which is our standard—when you whack something hard, you're much, much less likely to fall out forward.

In the 30 years that I rode—35 years that I rode short wheelbase chairs, I could not seem to stop falling out at least two, three times a year. Often at night in the rain, when I couldn't see the obstacles well, and since it was raining, I was rolling fast to get where I was going before I got soaked—ka-wham. Boom. And have had some injuries—know lots of other people who have had injuries.

We did a survey of Bay Area people in about '91 at San Francisco State. In the Whirlwind Center, we had a survey. We found 140 people who had been injured by their wheelchairs. It seemed that almost everybody we asked had been injured at some time in some way, and we tallied all those injuries, and all the types of injuries, and all the types of chairs—just looking for correlations, trying to learn what we could. Of course, they were all short wheelbase, and the biggest source of injury was falling forward.

Since then, there have been other studies of different types of samples of wheelchair riders. Each one has come up with: falling forward is the biggest risk to us. Not falling backward—though falling backward is another issue that we're also working on—but falling forward, because you're going at a speed —

04-00:44:56

Bonney:

And then you're going headfirst.

04-00:44:58

Hotchkiss:

You're going head first—head or hips—broken hips. So, where were we? We've got—the most recent chair, the Rough Rider, is the long wheelbase one, and that's the one I'm riding right now. The next one—who knows what it will be called—but I hope it will be one that doesn't tip backwards. With our Cambra [?], with our lower than average seat, we have good sideways stability and great frontward stability now. Even though our front wheels are smaller, they will cross—they're four inch diameter, a little more: four and a third—they'll cross the same sized obstacle, if you just coast into it—just sitting there, you're not popping wheelies or anything fancy, ramming into it without touching the hand rims, they will cross a one and a half inch obstacle. A short wheelbase chair—even with a low seat, and the tip back a bit—even our Africa-1 style short wheelbase chairs—will only cross that same one and a half inch obstacle. If the obstacle gets higher than one and a half inches, the Rough Rider stops cold. The short wheelbase chairs—even the best of them—tip forward when it hits that obstacle. Nothing you can do to stop it—it just tips forward and dumps you on your face.

So we're happy with that, and now we're working on rearward tipping. We've had ways to prevent rearward tipping for a decade now. Spring-loaded or counter-balanced wheelie bars, other ways. We may get a five-wheel chair or a six-wheel chair. But they've all been too much extra to add to get acceptance among Third World wheelchair builders who are just barely able to build anything at all and sell it. So we're looking for ways to do it more cheaply than we've done it before.

04-00:47:23

Bonney:

So, the Wheeled Mobility Center—is that your organization? What —

04-00:47:31

Hotchkiss:

The Wheeled Mobility Center was the first name of Whirlwind at San Francisco State. Then in the mid-nineties, we changed it to Whirlwind. That had been the name of our chair for a decade at that point, and the chair was becoming better known, and people didn't know who Wheeled Mobility Center was. Whirlwind Wheelchair International is the name we chose, and it's worked OK, except that I have trouble saying it in English.

04-00:47:59

Bonney:

[laughter] It's not easy. There's a women's group in Whirlwind Wheelchair International—is that right?

04-00:48:12

Hotchkiss:

Right. Initially Whirlwind Women, and now they call it Women Pushing Forward.

04-00:48:22

Bonney:

And what do they do?

04-00:48:24

Hotchkiss:

They have worked with the women who build the Whirlwind. There were—again—Telmo [sp?] Ramos, running the initial three in Nicaragua in 1980, Panina Mutinda [sp?] in Kenya in the early nineties, until fairly recently. Fatuma Achan and Sharifa Mirembe, co-leaders of the group in Uganda, and a good number of our trainers, who have had more than their share of problems working with the guys. That varies a lot culture to culture, whether it's a problem—whether the women get dismissed or treated differently in the shops, or can work along with the men with less problems.

In some cultures, women basically are not allowed in shops. In other cultures, there always have been women working in the shops—Philippines, for example. We work with a large shop there, and it's always had women in the shop, and they have definitely had an influence on the quality of the chairs. That's another issue with women and men. The women have tended to be the ones who blow the whistle when things are being made poorly, when things are leaving the shop that aren't up to snuff, that might be dangerous, that might be problematic.

04-00:50:22
Bonney: So, does this women's group travel across the world like you do, and —

04-00:50:29
Hotchkiss: Yes.

04-00:50:29
Bonney: — and do they go with you when you go, or do they—

04-00:50:32
Hotchkiss: It all depends who's funding what. But, yes. We have mixed groups when we can, because there are women in every organization of disabled folks that we work with, and we like to—we need representatives of both men and women in order to have a well-rounded relationship with the group, and in order to foster development of the kind of organizations that we've seen work best, just like we need both disabled and non-disabled mechanics in the shops. We like to have people with disabilities at the decision-making level as well as at the hands-on level in every shop. We're happiest when those levels are the same—the same people are making the decisions who are cutting and welding and bending.

04-00:51:46
Bonney: Who's funding the activities now—Whirlwind Wheelchairs International, and the women's group?

04-00:51:52
Hotchkiss: Whirlwind Wheelchair International is currently funded by—we probably have a half a dozen funded projects right now. We just finished one with USAID [United States Agency for International Development; AID] in Colombia. We don't know when—if ever—we'll start anything new with AID. Most of it comes from private foundations, various ones—the Schultz Foundation funded us to work with a Norwegian wheelchair manufacturer in trying to bring our welding fixtures and our custom tooling for bending and fabricating more up to Western world standards. Everybody can save money if they make things faster and make things better, more precise. We would like to have our parts more interchangeable, less handmade, more —

04-00:53:03
Bonney: Is that the WIP project?

04-00:53:05
Hotchkiss: Yes.

04-00:53:05
Bonney: OK. And I forgot what that stands for, but—what is WIP? Whirlwind Industrialization Project, is that right? OK. So that's still going on. OK. What countries are involved with the WIP program? Just Finland and —

04-00:53:39
Hotchkiss: Not Finland, Norway.

- 04-00:53:40
Bonney: Not Fin— I mean—Norway.
- 04-00:53:42
Hotchkiss: Norway and [inaudible] the state of California, and work has gone on related to that project in Uganda and Vietnam.
- 04-00:54:00
Bonney: OK. And their goal is to kind of create products that are for sort of the common good of everyone that can be replicated anywhere, is that right? Or replicated —
- 04-00:54:11
Hotchkiss: They were looking at manufacturing custom tools in Norway in their wheelchair shop for startups in any country, so they would actually ship out a big crate of welding fixtures and bending tools. We're not sure what the future of that is. We've definitely advanced our technology. We've changed the design of many of our fixtures, with an incredibly good level of help from the inventors in the Norwegian shop. Norway has wages as high as the U.S., if not higher. They have to be very efficient to successfully manufacture and sell chairs there. It's a little shop of 20 people, and they make chairs for the geriatric market, and very high quality chairs. I think it was a good match.
- 04-00:55:17
Bonney: OK. You mentioned the MacArthur Foundation before? Now, you were awarded a MacArthur Fellowship in—what year was that?
- 04-00:55:27
Hotchkiss: '89.
- 04-00:55:28
Bonney: '89. What was it for? What were they recognizing you for?
- 04-00:55:36
Hotchkiss: For working on wheelchair design in developing countries, I suppose. They never say exactly—but that's what they talk about in their description of the winner, or of a Fellow. They describe some project of everybody.
- 04-00:56:00
Bonney: And how did you use the money? Are you living on it, or did you —
- 04-00:56:04
Hotchkiss: Quickly. I put most of it right back into the project. I had a choice of doing that or paying tax on it.
- 04-00:56:16
Bonney: Oh. I see.
- 04-00:56:18
Hotchkiss: So, I just kind of reinvested it. It really—it definitely speeded us up.

04-00:56:22
Bonney: So it went back into wheelchair—Whirlwind Wheelchairs International? Is that where you put it?

04-00:56:26
Hotchkiss: Wheelchair. Singular.

04-00:56:28
Bonney: Wheelchair.

04-00:56:29
Hotchkiss: It didn't go through Whirlwind Wheelchair. I would just buy lots of tools and lots of materials, and take them over to State or use them in my shop at home, and during those years, I could try out anything I wanted—didn't really have to worry about the cost of materials or anything else. I also hired a lot of help, just on my own, to deal with paperwork. There was a lot of that, because there was a lot of press that happened with regard to that MacArthur award, and also, I was trying to build something more sustainable, so we did a lot of proposal writing in those years.

04-00:57:13
Bonney: We're going to have to stop there, because we are out of tape.

Interview #3: May 14, 2007

[Begin Audiofile 5]

05-00:00:00

Bonney: OK. This is interview three with Ralf Hotchkiss. It's Monday, May 16th.

05-00:00:12

Hotchkiss: May 14th.

05-00:00:13

Bonney: May 14. I have a couple more questions for you, Ralf about your work at San Francisco State, and then we can move on. There was a Ralf Hotchkiss Chair in Appropriate Technology for Disability that was established at San Francisco State in your honor. Can you tell me how that came about, and what went on with that? What happened with that?

05-00:00:47

Hotchkiss: It was an idea of our President – [President Robert] Corrigan—at San Francisco State, and it was a nice idea while it lasted, but it required raising more money than I could raise to make it real, and so a few years ago, we gave up.

05-00:01:05

Bonney: Oh. Now, what—he wanted to have an endowed chair. Is that right?

05-00:01:10

Hotchkiss: Right. We had to raise \$1.5 million or so—more or less—to endow a chair, so that it would generate enough income to provide a salary—ongoing—and I raised—well, I and the development department and Peter Pfaelzer, who was working on it as well—between us we could only raise about \$160,000, about a tenth enough. So we went back to just struggling to raise what we could each year.

05-00:01:45

Bonney: Well, usually an endowed chair has a big chunk of money behind it that someone donates, doesn't it? And then you —

05-00:01:52

Hotchkiss: We were looking for that person. It was a fantasy, honestly.

05-00:01:55

Bonney: Oh. So, the university didn't—

05-00:01:58

Hotchkiss: They created the —

05-00:01:59

Bonney: They didn't have a donor when they had this —

- 05-00:02:00
Hotchkiss: That's right. Oh well.
- 05-00:02:02
Bonney: Too bad. Too bad. There was a great write up about it, and the thing said it was the first chair in the country devoted to the interaction of disability, designs of appropriate technology, and engineering from a humanistic perspective. Sounded really good.
- 05-00:02:24
Hotchkiss: I hope there a few other chairs that have all of those criteria as well.
- 05-00:02:29
Bonney: Well, that's too bad. So, now, you're not working there, then, as a chair—you are just an adjunct professor there, or...?
- 05-00:02:38
Hotchkiss: I don't have a formal title that I know of. I'm a senior research scientist, or something like that. I'm chief mechanic of Whirlwind Wheelchair.
- 05-00:02:55
Bonney: You still, then, have to generate all the money that your lab and your programs get?
- 05-00:03:03
Hotchkiss: Well, at that time, I didn't—the university was covering my salary. They wanted to find a way to keep doing that without shelling out from their discretionary funds each year. We never found a way to do that, so now Marc Krizack, and our board, and Joan Rogin , who's our main writer, editor, and organizer of things like fundraising—between us we scare up enough money to make a sort of a salary.
- 05-00:03:51
Bonney: For the three of you, or —
- 05-00:03:52
Hotchkiss: No. Joan is retired and volunteers. Marc and I are both—unfortunately—now on half time, but working time and a half. So, it's hard to get a job on the side.
- 05-00:04:09
Bonney: Yeah. Well, it's also very hard to do a job while you're trying to fundraise and scrounge up money to keep you going. That must be stressful.
- 05-00:04:19
Hotchkiss: It's also easier to raise money for projects than for salary. It's hard to have enough projects to take little bits of time out to equal a full salary, or even a good salary.
- 05-00:04:36
Bonney: Did the president of SFSU change?

- 05-00:04:40
Hotchkiss: No.
- 05-00:04:41
Bonney: Oh—it's still the same?
- 05-00:04:41
Hotchkiss: It's the same president since just before I started there.
- 05-00:04:46
Bonney: OK. So they just decided at some point that their support had to end, or —
- 05-00:04:52
Hotchkiss: They gave us basically ten years of seed money—that's a pretty healthy period of time, and if we had more of a fundable project—if it wasn't in this damn disability field—we might have—we should have—found much better sources than the ones we did.
- 05-00:05:17
Bonney: OK. All right. I also wanted to go back—in November of 2006 in India, there was something called the First International Consensus Conference on Wheelchairs for Developing Countries.
- 05-00:05:35
Hotchkiss: November, 2006.
- 05-00:05:36
Bonney: Right. Can you tell me what that was, and what it tried to do? Or what it did?
- 05-00:05:43
Hotchkiss: Well, it's just a beginning—we'll see how it goes in the future. It's the beginning of a long process. What we did was bring together most of the Westerners involved in wheelchair design, development, and provision in developing countries and a good number of the African, Indian, and other developing country wheelchair builders—mostly wheelchair riders who have built their own, and are building lots more for other people.
- We reached consensus that one, there's a great need for standards in developing countries, just like there is a great need in the Western world for wheelchair standards. Starting in the sixties, we have worked on wheelchair standards in this country. I've been involved in it since the sixties, and as our standards became adopted and began to be enforced, first for all wheelchairs sold to the Veterans Administration, which is about 10 per cent of the U.S. market—it's the biggest buyer. Now, it's enforced for wheelchairs sold through many government and private sources.
- When the standards first became enforced, we knew they were pretty good—at least they were a good start—because virtually all the chairs made in the United States flunked the tests. We knew they were flunking our tests in the street. We knew that our chairs were falling apart underneath us, and the

manufacturers, one by one, were forced to—and did—improve their chairs. The standards still need some more work there. Things missing, like frontal impact into a curb—footrests, caster forks still fail. There are some other things that could be strengthened.

Well, we got together in India, decided one, that we needed standards. Two, we established a voluntary network among us to create the first drafts of those standards. And three, we decided on some of the criteria for good standards for developing countries, and reached consensus that those standards—in fact—would be considerably stronger than the standards wheelchairs have to meet in the West, in Western countries. So that the chairs will have a better likelihood of surviving over unpaved roads, and through monsoon seasons, through mud and sand, and so forth for a reasonable length of time. Also, the process is just beginning. We've been circulating first drafts of kind of an outline of a standard, and give us ten years, and ask how we're doing—I hope we'll be doing very well by then.

05-00:09:40

Bonney:

Now, are these standards going to be developed in such a way that every country can meet them, given that not everybody has the same materials available and the same—they don't make the chairs the same way...

05-00:09:55

Hotchkiss:

Good materials are available everywhere. The Whirlwind, for example, is made out of the same kind of very inexpensive steel tubing that restaurant chairs are made out of worldwide. Just the cheapest furniture tubing. If you design it right—with big enough tubing sizes, and thick enough tubing walls—you can make it as strong as you want. You could make a truck out of tubing, if you needed to. Materials are not a problem. Tubing has become available pretty much worldwide over the last 40 years, gradually, and we've kind of followed that industry around the world. But bicycles were the first great source of tubing. It was inexpensive. Tubing was made for the \$50 bicycles that are available now, all over India and China, and the \$70 bicycles all over Africa.

So, I think the biggest difference between countries is how much they can invest in testing equipment. In the U.S., a lab to do wheelchair testing will have a double drum tester that will whack the wheels with bumps at random times, and go a couple of hundred thousand bumps per wheel, and it will have a drop test. We'll lift the chair up—not very far—and drop it a few thousand times with a 100 kilogram load in it—and that's a 220 pound person—and the load they put in, in fact, is even more of a load than a human being would be, because the dummies they use are much more rigid than we are. We're kind of flexible, so we're easy on our chairs. Of course, they're only lifting the chair two inches, and when I go off a ten inch curb, whether or not it passed a two inch drop 5,000 times doesn't mean much. So, we're making those tests much tougher in that way.

But about 15 years ago, Whirlwind published kind of a bargain test lab standard, where instead of spending \$100-200,000 on test equipment for all the double drum testers, and the drop testers, and the other equipment—pendulum impacts, and so forth—we made a test where all you needed would be a 100 pound spring scale—a big fish scale—and a few bags of sand, and some wooden curbs and ramps. That's pretty much it. We could test a chair in virtually every way the Western standard tested it, but instead of doing things—for example—200,000 times on the drum test, we would do a much, much more severe slamming into bump test, and just do it a few times. So, it's a different way of testing it.

By making the test more severe, we ended up with a very simple, inexpensive test you could do in an afternoon or a day, and when a chair passed our test, it was almost sure—over time we found that it was almost sure to pass the Western test as well. That there were only a few types of failures—and very rare failures—where it might slip through one test—at least slip through the Third World test, and fail the Western test. Of course, a lot of them that pass the Western test fail our test, but that's another issue. We don't care about that. We wanted a test that approximated real use in the real world.

05-00:14:10

Bonney:

At some point, are you going to try to mesh the two standards, so that all wheelchairs meet this stringent —

05-00:14:18

Hotchkiss:

Some of the people involved in our standard are still involved in the setting of Western tests. A fellow named Peter Axelson—was in Santa Cruz, now he's in Nevada—is the most active American consumer currently in the development of wheelchair tests, and he's watching closely everything that we're doing. We're passing information back and forth, and one of his missions in life is to continue to work—basically debating with the industry—to finally get them to agree to raise their standard bit by bit, and he's been very successful at that for now 20 years—more than 20 years, 25 years. Since he was a student, pretty much. He took over where some of us left off, and just ran with it. Because we have a link through Peter, and a few other links, we expect that we can set an example that will get the Western consensus organizations to raise their standard a bit as well—or, to continue to raise their standard.

05-00:15:40

Bonney:

Are they members of the Consensus Conference? Were they there?

05-00:15:44

Hotchkiss:

No. But, there's still interaction all the time.

05-00:15:51

Bonney:

But they seem interested?

05-00:15:53

Hotchkiss:

Yes.

- 05-00:15:53
Bonney: Do they?
- 05-00:15:54
Hotchkiss: A few. Well, like Peter—our consumer representative in the Western process—is very interested, and has been all along in our low-cost testing techniques. He's had a lot of input into our developing those techniques.
- 05-00:16:12
Bonney: Where does he work?
- 05-00:16:13
Hotchkiss: Nelson, NV. [correct city?] He tests our chairs, as does the University of Pittsburg—Rory Cooper. Both of them are testing our Whirlwind chairs, and other developing country chairs, using the full Western equipment, and the 200,000 cycles—it takes three days and three nights. Doing all of that for our chairs, and doing it for free, and thus helping our process a lot.
- 05-00:16:48
Bonney: You also—I think—were part of trying out, or looking at, or planning the Segway?
- 05-00:17:01
Hotchkiss: Oh, I just tried it out, and test drove—not the Segway, but the iBot, which is like two Segways in one. It's the power wheelchair that can pirouette on two wheels.
- 05-00:17:14
Bonney: OK. All right. So, it's the one that you just sit up high on a seat, and it's got two wheels under you, and you can rock a little back and forth, and just move all around.
- 05-00:17:24
Hotchkiss: Yep.
- 05-00:17:25
Bonney: Have you tried it out?
- 05-00:17:26
Hotchkiss: Oh, yeah. I tried it seven years ago, and I've tried it since then.
- 05-00:17:29
Bonney: Is it creepy?
- 05-00:17:31
Hotchkiss: It's a lot of fun. I think it's truly a breakthrough, and I think that it will have a lot of spin-offs in other technology. It kind of shows us what can be done—how good a power wheelchair can be. How much fun it can be. I mean, the first day I tried it, it was up and down the stairs with no problem on the first try—though most interesting was going over big rocks, and very soft sand, with it. My favorite way to use it wasn't with just two wheels balanced up

high, but using all six wheels, or the four bigger wheels, in which case it feels like driving a Jeep with a powered suspension—a suspension with a sense of balance. It's a great machine, and it would go all kinds of places, where previously only Whirlwinds have been. It's also a lot of fun on the dance floor.

05-00:18:37

Bonney: I can see that. Yeah. But you went to New Hampshire, didn't you?

05-00:18:41

Hotchkiss: Yes. Yes.

05-00:18:42

Bonney: To work—is that where you worked on this?

05-00:18:44

Hotchkiss: I just—again—just tested it for them, and gave them my feedback, and interacted a lot with their engineers. But they have a bunch of very interested and energetic, very bright engineers.

05-00:19:02

Bonney: Dean Cayman, did you work with him?

05-00:19:03

Hotchkiss: Dean Caymen is—right. He's the one who pulled it all together.

05-00:19:07

Bonney: Have you worked with him?

05-00:19:08

Hotchkiss: Yes.

05-00:19:09

Bonney: Tell me about him a little bit. What's he like?

05-00:19:12

Hotchkiss: He's like a lot of inventors. He has plenty of ego, and plenty of energy, and luckily he's also very capable of working with and deferring to this team of 100-some—probably now over 200—of the best and the brightest. It's like a little NASA [National Aeronautic and Space Administration] there. They really do work hard, and they are leaving no stone unturned on the particular subjects they're working on, like water purification, and sterling engines, which may be an engine of the future.

05-00:19:55

Bonney: You said you see a lot of possibilities for spin-offs from the iBot. What do you see? What might be possible?

05-00:20:07

Hotchkiss: If we know that a wheelchair can have a sense of balance, and if that becomes inexpensive—and I would expect that it will, because—for example—the gyroscopes that balance the iBot on two wheels at any height over all kinds of

rough terrain—those gyroscopes have been on the market for—I believe—over 20 years. It's a standard NASA part. NASA's been the only big customer, but as more people find uses for it, the prices will come down.

Well, there aren't many iBots out there yet, but there are plenty of Segways, and the Segway is using it every day. If you have—for example—a regular power wheelchair, power wheelchairs now pretty much all have six wheels. The new ones have all put balance wheels out back, and those balance wheels—well, they keep you from tipping over backwards, and that's a great idea. Very important. They also get in the way—a lot. They'll hang you up on culverts. Backing up, they'll get caught on all kinds of stuff. So, it would be nice if you could get back to four wheels instead of six wheels. If you had a balance system in your chair that would sense when you're tipping, you could basically just add that sensing circuit to a regular old wheelchair, and you would be safe against tipping over backwards.

The iBot doesn't have anti-tip wheels in the back—doesn't need them. Doesn't need them any more than a person walking needs to have—what do you call them?—these circular walkers that toddlers use. They walk in the middle with six wheels around them? Sure, people fall over once in a while, but in general, we don't need balance wheels all around us once we learn to walk. And neither does a wheelchair, if it has a way to learn to stay upright. And that—I would expect that that shouldn't add much percentage at all to the cost of a power wheelchair, once that device is out there, once things like Segways—and there are a lot of other inventions that will spin off from the Segway that will probably use gyroscopes. So, once that part comes down to a reasonable price, and once the circuitry—the computers that interpret the output of the gyroscopes and tell the motors what to do—once those computers are inexpensive—and that shouldn't take too long, because computers are dirt cheap, now. You can buy them for a buck a piece.

05-00:23:02

Bonney:

What do you mean by "not too long," in this instance?

05-00:23:05

Hotchkiss:

Oh, ten or 20 years. I think. Yeah, the prices are coming down now. I think that they might level off at—like computers. When I was first working on computers in the early seventies, they cost a lot. Hundreds of dollars for this little chip. Now you can buy most of the same computers I was working with for under a dollar. They're right there in the catalogues. Maybe two or three dollars at most. Very simple, little—and you can even buy chips with four computers on each chip. By computers, I mean things like op amps [Ralf, right word? If so, what does op amps stand for?] like the highly sensitive amplifiers that we were using to put together to make computing circuits at that time.

05-00:23:50

Bonney:

So, the iBot can never fail.

05-00:23:52
Hotchkiss:

Oh, it can fail.

05-00:23:54
Bonney:

It can fail?

05-00:23:54
Hotchkiss:

But, it's interesting. One of the nicest things about the iBot—I've studied their patents. They have easily a dozen patents on the iBot and related technologies. One of the nicest things about the iBot is how gutsy the inventors are—Dean Cayman and gang—at admitting its faults, at admitting its hazards, and on seriously working on correcting those hazards, but describing them in full detail within their patents. So, they have patents showing several ways in which the iBot can fall, and they've pretty much modeled it after a walking person. I mean, we would be more stable if we used all four of our legs, but we don't anymore, because it's more convenient just to use two.

As we learn to walk, we learn how to—for example, we start to tip sideways, we will spin around so that we can be facing toward our tip and run forward a bit, and set ourselves up. If you watch a little kid learning to balance, they have a lot of twists they use. Well, the iBot can do all those same things. As it tips one way or another—say one wheel goes off the edge of a curb, for example. The iBot will spin right around, face up the curb, torque forward, and at the very least, it will radically slow its fall, by torquing on its wheels. Very nice stuff.

If anybody gets injured—or as people get injured—people will get injured, just like we get injured on plain old wheelchairs—it'll be quite clear that most of the failure modes were well understood, that we are taking some calculated risks, but those risks are well calculated, at least. The inventors tried hard to make it as good as it could possibly be, and if the mechanism fails—the iBot itself fails—and the computers don't properly tell it to do as well as it can in lessening the impact when you fall, or in catching its balance—spinning around and catching its balance, and even preventing a fall—then, well, sure. Perhaps there will be some liability. Somebody can say, "Well, it your guys' fault, because your computers didn't—your computers failed." But the failure is fairly unlikely—the failures are as unlikely as reasonably possible, because—for example—they have three redundant computers in the iBot. Two of them fail, and the third one runs just fine. Every motor has dual windings in it, and dual connections. So, if part of the motor burns out, the motor still runs.

05-00:27:01
Bonney:

How do you know if a motor burns out? How would ever know that until the second one burned out?

05-00:27:07
Hotchkiss:

It'll tell you.

05-00:27:08

Bonney: Oh, it does?

05-00:27:09

Hotchkiss: It'll sense it, because it'll have to be sending current to the other half of the motor—all the current—so, just half of it or another —

05-00:27:15

Bonney: So, it'll flash a light, or something, and tell you —

05-00:27:18

Hotchkiss: It'll flash the light, it'll—it'll probably curse you out.

05-00:27:25

Bonney: [laughter] OK. What about universal design in wheelchair design? Is there a place for universal design in all of this?

05-00:27:35

Hotchkiss: Oh, absolutely. Yep. My grandson is the best example of universal design. He rides wheelchairs at age three. He just finished spending half of the last two days over the weekend riding a wheelchair—for fun.

05-00:27:55

Bonney: An individual chair, himself?

05-00:27:58

Hotchkiss: His own. Right. He has two of them.

05-00:28:00

Bonney: Oh. OK. But he's not a disabled child.

05-00:28:04

Hotchkiss: Not yet. No. But his first wheelchair is getting a little small for him. It was designed to work before he could walk, and he pushed it a little before he could walk, but then of course as soon as he learned to walk, he forgot about the wheelchair for a while, because he could go more places without it. But now he's back into wheelchairs in a big way, like he's into tricycles, and he's into bicycles, and so he has one at my house that's a kind of an old, standard, kid-sized wheelchair, and then there's another one at San Francisco State that's one of our experimental kid-sized wheelchairs. It runs much faster. It's lighter and quicker, and he really knows the difference. He wants me to bring that one home all the time.

Of course, we're working it there. You can't have it all the time. But as chairs get better and better, better in how they work, as well as in better in that they don't cost so much—that they're long-lasting, inexpensive to use per year of use. I expect that eventually there will be more and more—in my [grand]son's life, there's a gray area. Here are tricycles and bicycles, and here's walking, and then between there are wheelchairs. They're kind of a compromise vehicle. That gray area—as wheelchairs get better, he uses the wheelchair

more and more, has more fun using it, goes faster, and can go farther—and as chairs get better and better, eventually, I hope that wheelchairs reach a point where they actually are used for recreation. A scooter, for example, could be used. In fact, scooters are the best example, perhaps, of universal design. Many older folks use scooters. Many shopping centers or large stores now have lunar [Ralf, what is the word?] scooters, and they're not necessarily for people with disabilities. They might be for older people, or people who are particularly tired, or mothers who have just too many kids to carry. They hop in the scooter, and they scoot around the store, and then they leave the scooter, and they go. Well, there's a wheelchair with universal design used every day today.

05-00:30:54

Bonney:

I never thought about it that way, actually. Neat. What do you think is the biggest advance right now in the technology of wheelchairs?

05-00:31:15

Hotchkiss:

The iBot.

05-00:31:16

Bonney:

Is it?

05-00:31:17

Hotchkiss:

And the Third World chair. Coming from both ends of the spectrum. That's where the most active work is happening, worldwide, at the moment. Way at the top and way at the bottom. The iBot is—again, it's such a smashing breakthrough. Of course. And I don't care that it costs \$26,000—unfortunately, they're taking a loss even at that price—because it needs to cost what it needs to cost. The iBot is so many simultaneous systems, you can take bits of the iBot and apply them to a good number of other power chairs—like keeping regular power chairs from tipping backwards. Only that—that's only 10 per cent of the iBot's brain.

There are other aspects of the iBot. There are many other aspects. Like the design of motors. Simultaneous with the iBot has been a development of much more torque motors—motors with much higher push power, and motors that just don't fail like motors used to fail. That isn't necessarily because of the iBot, but the iBot was one of the few leading-edge wheelchair designs that was pushing the envelope for all the rest to follow. There are still some bad motors out there on wheelchairs that fail regularly. But as they become more like the iBot and a few of the others—like the Quickie P-200, which now is 15 years old, but was designed with no compromises—no compromises, in particular, in the motor design. The Quickie P-200 has over 200 horsepower of motor in it in those two motors. That's way more power than you ever want to use on that wheelchair, but by over-designing it, they make it so that that motor almost never fails—only after a lot of thousands of miles.

05-00:33:37

Bonney:

Is there any movement by the iBot people to start looking into putting the iBot technology into wheelchairs?

05-00:33:48

Hotchkiss:

I just heard there was, with the Segway. But I don't know if that's the iBot people, or if that's somebody else. I know somebody else has built at least one Segway with a seat on it, to replace a scooter. So there's a \$5,000 scooter that will go places that scooters will never think of going, and go there with a lot more pizzazz and fun. But I just heard that. I have to track it down. There are a lot of types of Segways out there now, made by the iBot people—off-road Segways, off-road, rough ground, as well as more indoor types, or industrial models for scooting around huge factories. Certainly if I were going to take a Segway and use it for a wheelchair, I would take the off-road model. As that one gets better and better, and the Segway is—well, relatively inexpensive. Again, around \$5,000. Relative to a power wheelchair, that's inexpensive. Relative to the iBot, that's a fifth of the price. So, they really are working on universal design in developing the Segway, because the Segway is potentially very applicable to power wheelchairs.

05-00:35:43

Bonney:

That's fascinating. You wanted to talk a little bit about public transportation.

05-00:35:57

Hotchkiss:

Yep. So, adventures: I've been having fun with public transportation, along with a lot of friends with disabilities—people like Hale Zukas. I assume he's been interviewed?

05-00:36:11

Bonney:

Yeah. I interviewed Hale.

05-00:36:19

Hotchkiss:

Yeah, riding around with Hale, he usually has to tow me, because I can't keep up with him. Especially with his old chair, which was good for ten or twelve miles an hour. Riding along with him was a great example of how badly we need public transportation, because he rides around where public transportation isn't available. Not only is it very dangerous, but it's downright hair-raising, because he'll be going at top-speed between semi-trailers and parked cars over railroad tracks, towing me behind him. Starting in '66, I immediately started using public transportation. At first, I didn't have a car, and was doing rehab in Chicago, and public transportation was not accessible yet. They hadn't even thought of it, really. Certainly hadn't done a thing about it. Buses, trains, airplanes, boats, taxis—all of the above. Taxis, of course, are the easiest, but the most expensive. Well, easiest if you have a lightweight folding chair, at least.

05-00:37:45

Bonney:

I didn't tell you my experience on the taxi in San Francisco. Later.

05-00:37:52

Hotchkiss:

Later. So, one of my fairly early experiences—after having tried Greyhound Buses, city buses, a good number of airplanes, and trains, and taxis—I rode Amtrak in Washington, DC. I believe it was 1971, and Amtrak was brand new. I was going to ride the Metroliner to New York. The Metroliner was one of the first more accessible trains in the U.S., in that they raised all the platforms. The train's not much different, but the platforms were all raised: no stairs to get in or out at any stop. They did that in order to speed things up. The cost of the raised platforms was quickly regained in the extra tickets they could sell.

But it had been a private railway before. Well, railways had—in my experience, at least—policies similar to that of steamships, in that they would get you onboard—didn't matter, they could get an elephant onboard, if they wanted—and it was a matter of pride with the people working on the trains that they would help you onboard regardless. Almost all my traveling was alone. Never had money to pay an extra ticket just to bring somebody, certainly, and so I just rode alone. They threw me off the Amtrak, saying, "Oh, well, now we're run by the federal government, we've adopted the Civil Aeronautics Board Rules for airline travel, and they say that you need to bring an attendant with you if you're non-ambulatory."

I fought, fought, fought. I got on the train anyway, as I've almost always succeeded in doing in almost any mode of transportation where they try and play these tricks, but I knew that it was going to be difficult to use that train on a regular basis. I had a job in New York, I was living in Washington, I needed to go up every few weeks. I was outraged. I was outraged. Because here they were stepping backwards in a big way, after 100 plus years of accessible—accessible by hard work, not by design—train transportation.

I talked to my hometown congressman about it—that was John B. Anderson. He was outraged as well. He was doubly outraged in that the bureaucrats who had established Amtrak, after he had approved—along with the rest of Congress—their taking over the passenger rail to save it from going bankrupt, and thought they were going to do things as they had been before—that they had done it quietly, secretly, under his nose.

He immediately called hearings to investigate the new, inaccessible Amtrak passenger trains. Turned out that this new rule applied to the whole Amtrak system, and he asked me if I could help him find people to testify. Well, I found a few people with disabilities who had plenty of transportation experience, and all were willing to testify. But what he really wanted was people from the transportation industry. I checked all over in the airlines and the buses, couldn't find any company who would give any representative to talk about how they handled it, and why it needs to be done—until we checked American Airlines. They sent Bob Samson, who was a wheelchair riding vice president of United Airlines. How did he get there? He flew on an

airplane. Did he come alone? Well, of course. He's a working man. He comes alone. When he testified, it was minutes before Amtrak was begging for mercy.

05-00:43:03

Bonney: Good.

05-00:43:06

Hotchkiss: They scrapped that rule immediately, and they immediately went to work on designing accessible railcars. If you ride in Amtrak, and if they have kind of a long, thin accessible bathroom that fits only on one side of the aisle—not a big, square one with 90 degree transfers —

05-00:43:33

Bonney: Oh, no, I've only been—the one train I was on had a great, big one.

05-00:43:39

Hotchkiss: That's a newer one. That's a newer one. Yep, that's the West Coast variety. But all the way up and down the East Coast, they still have long, thin bathrooms. They hired me, and I ended up working on bathroom design in the trains with them for some time—quite a while—through the seventies. Eventually, they said that there was no way they could fit a bathroom wide enough—five feet by five feet square, the minimum size of one, so you can transfer in various directions. So, they had to fit in the space alongside the aisle. That was it. It was a retrofit sort of a thing.

So we came up with a large, sliding door to pull in, and there you are with a 180 transfer. Well, we put the toilet at a 45-degree angle in the far corner of the room, so now it's a little less than a 180 degree transfer. Then they had a flip out kind of transfer board built into the wall of the train. I just saw one a couple of weeks ago on the East Coast. They're still there. I've been getting complaints about that ever since, especially from my quadriplegic friends, because there's not a whole lot of room in there for somebody to stand to help you transfer. A pain in the ass, so they say. That's where we were in the seventies.

05-00:45:22

Bonney: How did they get to the new five by fives? Actually, the one I was in was bigger than a five by five—it was huge.

05-00:45:28

Hotchkiss: Right. Once they get rid of the aisle—move the aisle to the other side of the train—they have plenty of space to work with.

05-00:45:34

Bonney: So they just reconfigured the train interiors when they got new trains?

05-00:45:36

Hotchkiss: Right. It was when they were building completely new cars. Way back to the seventies, that was on our wish list, but for a while, they kept building new

ones of the old style, just like—yeah. It'll be a while before we see any way to use the bathrooms in Greyhound buses. Who knows when and if.

05-00:46:03

Bonney: Even getting on a Greyhound bus.

05-00:46:06

Hotchkiss: Have you done it, yet?

05-00:46:07

Bonney: Nope.

05-00:46:08

Hotchkiss: With the lifts?

05-00:46:09

Bonney: Nope.

05-00:46:09

Hotchkiss: They work.

05-00:46:10

Bonney: Do they?

05-00:46:10

Hotchkiss: Yep. I took one from L.A. to here, a while ago, and another one from here up to nearly Seattle. One time traveling with a kid, the other time, just alone, and I liked it. They slide two sets of seats forward, and pancake them into the seat ahead, making a big parking space for your chair in the middle of the bus. The lift comes right up—the wall of the bus opens—the lift comes right up to alongside your seat. You drive into the bus. Both of them were overnight trips, and I ended up transferring into the bus seat, reclining it as best I could, putting my feet up on my wheelchair seat, and snoozing the whole way. It was quite comfortable.

05-00:47:08

Bonney: Yeah, we haven't tried Greyhound in about 20 years or so. We had such a hassle, and it was such a big problem.

05-00:47:16

Hotchkiss: Yeah. I've been dragging my rear end up the stairs forever. Since '66, I've probably ridden on 100 plus Greyhounds. There's a couple of more stories. Once in Palo Alto, after I got on, they told me I had to get off. Greyhound used to follow this Civil Aeronautics Board rule as well—didn't allow you to travel alone.

05-00:47:47

Bonney: You had to pay for the extra person, for a while.

05-00:47:50

Hotchkiss:

Of course. I didn't live in California yet. I was just visiting. So I happened to be in Palo Alto. I looked around—there were some people who might have traveled with me, but I didn't know a one of them. So I told the driver, "Well, you'll have to go get your supervisor, and we'll discuss it." By the time he came back with the supervisor, I had the whole bus full of people rallied and ready to block the door. They were not going to accept—I mean, the people on the bus were—some of them were quite irritated at what they saw happening. Another time, I was traveling with my son, when he was about six months old, from Sacramento back to Oakland. Had already traveled the same day to Sacramento.

05-00:49:08

Bonney:

This is on Greyhound?

05-00:49:09

Hotchkiss:

Greyhound. Both times Greyhound. So, was just returning on a roundtrip. But as I got on on the roundtrip, was told that I couldn't travel alone. At that point, I was outside the bus.

05-00:49:32

Bonney:

But you weren't alone.

05-00:49:33

Hotchkiss:

That's what I told them.

05-00:49:37

Bonney:

[laughter] I would have, too—I'm not alone.

05-00:49:39

Hotchkiss:

They closed the door to the bus station, so that the other people wouldn't come out, or I might have been able to get help from them. I wanted to get on the bus, so at least they'd have to take me off. The station agent—the supervisor—came out fairly quickly. I was still outside the bus. Told me, "No, we're not allowed to take you. We cannot take you. It's just out of the question. Why's a person like you want to live in the world anyway?" Quite terse, abrupt, nasty—which made me all the more interested in getting on the bus. I said, "Just as you would if you wanted to get all the black people to sit in the back of the bus, you better go get a policeman to enforce this so-called rule of yours, or law of yours, that you're citing, because a policeman is here to enforce the law. So, go get a policeman, because I'm not moving from the bottom of these stairs." That took him a little longer.

05-00:51:04

Bonney:

I would imagine.

05-00:51:05

Hotchkiss:

By the time he came back, I was in the bus. It was a little trickier, because I had the kid, but he had shoulder straps on his OshKosh overalls, so I held him in my teeth, and sat on the stairs and slid up into the bus. When he finally

came back out—again, I was the only one there, so there are no bystanders to back us up. But thank goodness, it was a black policeman. We talked first about sitting in the back of the bus, and the policeman already was a bit irritated, and he was ready to tell the station agent just to go to hell, and he did so. So, we got our return trip.

I had a similar experience on Texas Airlines. In that case, I went to the pilot's lounge, found the pilot, and got the pilot to exercise his rights as captain of the ship—the pilot is in charge of who rides and who doesn't, regardless of any bureaucratic rule. Regardless. That pilot got quite irritated by the fact that this bureaucrat station agent had pushed me off. Had some very harsh words. Pan Am Airlines—I was very happy when they went bankrupt, when they went belly up, because they were one of the worst in the world. Riding on Third World airlines, I've had plenty of experiences with others that were bad—like Philippine Airlines used to be a serious problem. I have a roundtrip on Philippines to Manila next week. I'll see if they've gotten any better.

05-00:53:07

Bonney: Let's hope so. For your sake.

05-00:53:11

Hotchkiss: Pan Am had no excuse. But Pan Am would be better in the U.S. than they would be overseas, which meant that a roundtrip would quickly turn into a one-way, and Debbie Kaplan and I were in the Philippines once. We weren't traveling alone. [laughter] I was her attendant, she was mine. Two wheelchair riders traveling together somehow was prohibited? Well, it didn't say so in the rule. Just said we needed an attendant. Well, either one of us would be legally responsible for the other one. What the hell. But they—in Singapore, they tried to dump us off, and we fought, fought, fought, as usual. I've been dozens of times around the world, various types of transportation.

05-00:54:06

Bonney: Have you ever ridden a train or flown with Hale? I mean, you talked a little bit last week a little bit about feeding Hale for five hours, and holding his maps, and all that.

05-00:54:18

Hotchkiss: So, that was one time.

05-00:54:19

Bonney: Have you ever been on a train with him? Because he's fascinated by trains.

05-00:54:22

Hotchkiss: I've been on trains with him. We've never had trouble.

05-00:54:24

Bonney: Did you?

05-00:54:24

Hotchkiss: Yep, yep. They happened to be accessible trains.

05-00:54:29

Bonney:

He doesn't make you go sit out on the train tracks at midnight to see the one train that's coming through at 3 in the morning that he wants to see?

05-00:54:38

Hotchkiss:

Oh, yeah. We've done that. We've chased trains. We've gone to the train museum in Sacramento and played with the steam engines. Yeah. I've had fun with Hale and trains. We've also spent time on the space between cars. We can have one foot on one car—one wheel on one car, one on the other, to feel the track really well.

05-00:55:03

Bonney:

Oh, geez. You do that, huh? Or he does it, you watch? You've been talking quite a bit, mentioning Debbie Kaplan and Desmond. Do you want to just talk a little about why they're important in your life?

05-00:55:20

Hotchkiss:

Well, Debbie and I were married for many years. We first got hooked up in the 504 demonstrations in Washington, then out here, as well. We had been working—both of us—for Nader for a while at that time. She was running the Disability Rights Center. We adopted Desmond in 1985, after we had been together for almost ten years. Adopted him right at birth—right at the moment of birth. Bringing him up—well, the best documentation of that is *Through the Looking Glass*. They took these porno flicks of me and Desmond in the bathtub, [laughter] when he was just a few months old. Tried to record the various ways that we would figure out to carry Desmond around when he was little.

05-00:56:33

Bonney:

Let's stop there.

[Begin Audiofile 6]

Bonney:

OK. This is tape seven of the Ralf Hotchkiss interview on May 14. Ralf, we were talking about how you took care of Desmond when he was a baby.

06-00:00:27

Hotchkiss:

Yeah, he was a handful. The two of us took care of him—kind of interchangeable. We were both working. I arranged things to work more in the house when Desmond was a baby, and that worked great. Also, I had some people who worked with me some of the time—part-timers. Both of them were experienced with babies, had a few things to teach me —

06-00:01:03

Bonney:

Now, were these people from *Through the Looking Glass*?

06-00:01:04

Hotchkiss:

No. No, they were just other people. [inaudible]

06-00:01:09
Bonney: Do you want to say a little about what Through the Looking Glass is, just for posterity's sake?

06-00:01:13
Hotchkiss: OK. Sure. Sure. Through the Looking Glass—if Megan [Kirshbaum] hasn't been interviewed, she should be. And get Hal [Kirshbaum], too. Through the Looking Glass studies what are the best ways to be a parent with a disability. What are the safest and the most effective ways to discipline your children, and haul them around when they're very small, and do everything that needs to be done. Of course, given that we have a very wide spectrum of disability types superimposed on a very wide spectrum of economic levels and just ways of doing things, it's a pretty complicated task that Through the Looking Glass took on to document and do training for. But, it was fun interacting with Through the Looking Glass people. They had a lot of good suggestions. They were very interested in just seeing how things worked with us. And some of the tricks we used—Debbie wasn't using a wheelchair all the time at that time, so we had a very small—what do you call it? Kids' scooter.

06-00:02:58
Bonney: Baby buggy?

06-00:02:59
Hotchkiss: Baby buggy—not a buggy, but a —

06-00:03:02
Bonney: Where you sat up in it, you mean? Stroller.

06-00:03:06
Hotchkiss: Stroller. Thank you. But I never used the stroller, because I was riding a chair, and one chair works for two people just fine. What I did do was reinforce the buttons and buttonholes in my sweater vest, and from the age of two days old, that was his riding vest. He would sit in my lap. I would button the vest up around him, and from the age of two days, he was looking out—looking ahead. Eventually—well, before long, he was telling me where to go, as well. All of that worked again with his son, just very recently. His son's now three.

06-00:03:51
Bonney: Who is also Desmond.

06-00:03:53
Hotchkiss: Who's also—Desmond, Jr.

06-00:03:54
Bonney: Desmond, Jr.

06-00:03:59
Hotchkiss: They both have been great adventures. With Desmond, Sr., I did a lot of traveling—took him to Siberia, to Sri Lanka, to Mexico—rural Mexico—a couple of times, where he was in heaven, because there were no cars to run

him over, and the preschoolers were free in this little town were I was working. It was a little town where there was no doctor within—Ahoya [?], Mexico. Maybe 1,000 people, with a big public square in the center, and a 400-something-year-old church with a very sagging roof, and a gang of these little three to six-year-olds running around. Just running all over town until they went to school. They had to teach him a few things, like don't stand right behind the burro, and don't put your fingers too much in the pig poop —

06-00:05:07

Bonney: Too much! [laughter]

06-00:05:12

Hotchkiss: Yeah. It was a great time.

06-00:05:16

Bonney: Does he remember any of those trips?

06-00:05:18

Hotchkiss: Yes.

06-00:05:19

Bonney: Does he? That's great.

06-00:05:20

Hotchkiss: Yeah. We went on a number of other trips as well.

06-00:05:25

Bonney: So, you and Debbie—at some point, then—divorced.

06-00:05:29

Hotchkiss: Well, we separated.

06-00:05:30

Bonney: Separated? Are you divorced now, or —

06-00:05:33

Hotchkiss: No.

06-00:05:33

Bonney: Oh. So you never have.

06-00:05:34

Hotchkiss: No. It's a bureaucratic nightmare. Neither one of us likes to deal with bureaucracy. So we basically haven't gotten around to it.

06-00:05:46

Bonney: OK. What do you see in the future, Ralf, for disability, disability rights, independent living situations, that sort of thing, in this country, and in the countries where you visit?

06-00:06:05

Hotchkiss:

I see organized people with disabilities leapfrogging over us in other countries. They'll show us what the future is. For example, African countries—Uganda first, South Africa more recently, and soon numerous countries around Africa are writing legislation that guarantees us a place in the government. Not just rights that we have to spit and fight to get a little of, but representation—people in the government every day whose responsibility is primarily to us to make sure that we have what's needed to participate in an ongoing basis.

As of a number of years ago in Uganda, they probably had in Uganda more people with—registered disabilities, they call them there—who were elected to public office in Uganda—smallest country, of 22 million people—they had more elected disabled representatives than the whole rest of the world put together. They had 45,000 people with disabilities in government every day, because when they require that we have representation that means at every level of government. If you do it right, it's not just a person with disability, it's a man with a disability, and a woman with a disability at every level of government—or more of them, it's a big legislative body. And that meant that all the way down to the village level, even the smallest committee on the village level, each one has to have a man and a woman with a disability who have persuaded the local community that they can represent people with disabilities. So it gets quite competitive to get those posts.

06-00:08:28

Bonney:

I imagine.

06-00:08:33

Hotchkiss:

The revolution there came at the same time as cell phones. Uganda never had a hardwired phone system, but they have cell phone repeaters up and down, at least the main road, all over the country. With cell phones came text messaging—they can't afford the voice—but text messaging is dirt cheap. So, when something is happening anywhere in the country—an issue with public schools, an issue with public transportation—housing is not much of an issue, because there isn't much. You make your own, there. But with employment, anything that's controversial, the word will get all over the country overnight. The messages will pour in from the hinterlands to the federal, national government, where there are disabled representatives within the legislature waiting for those messages, as well as a cabinet-level official with a disability also waiting for those messages to show, "Yes, we have a consensus from our represented block—our powerful block—and we will have change."

06-00:10:02

Bonney:

So they are taking a very different stance than we did in this country. We set up independent living [ILs] centers that then worked for specific services, like getting attendant care paid for, or getting IHSS paid for, that sort of —

- 06-00:10:22
Hotchkiss: You're right. Well, getting things paid for will happen some other lifetime in Africa. There's no money there. There aren't schools. There are jobs.
- 06-00:10:28
Bonney: Yeah. But it doesn't sound like they're setting up IL's. They're focusing more on getting into the government and working the system to make—I don't know if they're making laws, or rules, or regulations, or —
- 06-00:10:43
Hotchkiss: All of the above.
- 06-00:10:44
Bonney: — what they're doing, but they seem to be taking a much broader view of what's needed.
- 06-00:10:52
Hotchkiss: The independent living center network is a big advance from the charity model. They're saying, "We deserve to be integrated in these ways, and in order for that to happen, there must be some services." The African approach has leapfrogged over our approach, in a way, and they're coming from power, and saying, "Of course. We are integrated. Where it isn't working properly, we'll find ways to make it work."
- Covered services is another issue. There's just not much money. But to some extent, they are getting covered services. For example, provision of wheelchairs, provision of other technical aids is beginning to happen, as they develop local industry. They certainly can't afford to get imported, but they can make it for a tenth the price locally, and are doing their best to do so. Uganda is supporting several wheelchair shops, now, and several hand-powered tricycle shops. Automobiles—forget automobiles. Way too expensive. But hand-powered tricycles are very, very good for those who can use them. I have a little trouble—I can't get them into the outhouse, and they're a little bulky in the kitchen and the workshop.
- 06-00:12:34
Bonney: Yeah. I would imagine.
- 06-00:12:35
Hotchkiss: But for people who can walk with crutches, or even polio folks, who scoot on the ground, but do so very well, a tricycle might be more effective than a wheelchair.
- 06-00:12:49
Bonney: What do you see happening in South America and Central America in terms of independent living, and the future there? They don't seem to be taking this government tact that they are in Africa.

06-00:13:04

Hotchkiss:

No. Not yet. I have a feeling that that will spread from Africa worldwide, gradually. Give it 30 years, maybe. Latin America is a lot more like the U.S. than Africa is, as far as some of the details of life. Some of the important details—like the outhouses in rural Latin America have raised seats. Africa, it's just a hole in the ground, so you need a different adaptation. That's a pretty significant one, depending on your disability type.

Running water is more common in Latin America than it is in Africa, partly because it's a richer terrain, most of it. There's more water around. They don't even need pumps sometimes. They can siphon it, if it's a hilly area. They can siphon from a spring, or—electricity. They're more advanced than much of Africa. Depending where—it could go either way, but just the way of life in Latin America is more like here than Africa.

Unfortunately, the charity model is entrenched. Well, it's entrenched throughout the former English Empire. That's very much an English way of doing things—segregated facilities, charity for the poor, wardless cripples. And it's heavily entrenched in Catholicism, though it's hard to make comparisons.

Definitely there's a strong, strong disability movement in parts of Latin America, and it kind of comes and goes. For example, in Nicaragua in the eighties it was very strong. But as we squashed the country, we squashed the movement. Through the later eighties, so little was happening in any way in Nicaragua. It was such a poverty-stricken, and kind of reduced to ashes country, thanks to us, in a large way, that the coalition within the government fell apart. We polarized them, pushed our allies out of Nicaragua—interesting.

When we started making wheelchairs in the early eighties in Nicaragua, we had a bicycle parts importer, a bearing importer, a tubing manufacturer, welding supplier—that was our infrastructure. That, and running water, and electricity. That's what we needed. Several of our suppliers were politically active. They were in a businessperson's party—political party. It was a little to the conservative side of moderate. If you were to rate it that way. We closed all those businesses down by working through the World Bank, through other international banks, by prohibiting them from getting a letter of credit for imported parts.

So our bearing supplier, for example, instead of getting a letter of credit from the bank when they wanted to bring bearings from China, for example—or from Taiwan it was, at that time, primarily—they would—instead of—then when the bearings would come in, they would pay the bank. Instead, they had to prepay for everything. That could be 60, 90 days before they'd ever see the bearings, and it gradually put them out of business. There were other ways in which they were put out of business, like our blockage. Talk about prohibiting imports. If your job is importing—for the local infrastructure—ball bearings

and you're not allowed to, what do you do? Most of those people had to leave the country in order to continue making a living somewhere, somehow. Nicaragua just worked its way down to being far more agricultural, and far, far poorer. Mostly just poor.

06-00:17:55

Bonney:

Now, you said earlier on in your interview that you didn't see young leaders coming up in Nicaragua—the independent living kind of leaders.

06-00:18:05

Hotchkiss:

Right.

06-00:18:09

Bonney:

What's going to make that happen?

06-00:18:10

Hotchkiss:

I don't know. I don't know yet. The big swell in the eighties of young, active people—some newly disabled, many people with polio from the seventies, from the sixties, who had had polio long after the vaccine was given by the U.N. to the dictator there, but the dictator resold the polio vaccine, so the local tale is. So polio went right on. But these folks were very, very active. By the time the end of the eighties had come through, a good number of people with spinal cord injuries had died for lack of antibiotics, just because things were held so low in that country.

Through the nineties, things began to build up again, thanks to—we got our more "democratic"—i.e. more right-wing—people into power by starving the country until the country would go for anything, would try anything. Some industries really boomed, but it's hard to be a prostitute if you have a disability, especially a significant disability, and that was one of the biggest industries that bloomed.

There are other industries around, but they weren't hiring any people with disabilities. Forming your own way of making a living, like people had done in the early eighties—working in cooperative farms or manufacturing—the folks with disabilities were kind of left behind, those who survived. I don't know what's going to happen in the future. So many things have changed to make the environment less accessible, in the rebuilding of Nicaragua. Some of the worst architecture I've ever seen.

06-00:20:22

Bonney:

Oh, yeah. You mentioned the big squares, or —

06-00:20:24

Hotchkiss:

The circles. Right. The traffic circles. And the twelve-inch curbs, and so on, and so on.

06-00:20:33

Bonney:

Well, what do you see for the future for Ralf Hotchkiss?

06-00:20:38

Hotchkiss:

I'll just keep working on wheeled mobility. That's more than I can even scratch the surface of in one lifetime. Lots to do. We need wheelchairs that work as well as tricycles. I'm talking about for the 80 per cent of the world that doesn't have automobiles, and doesn't have much public transportation, nor the money to buy the bus ticket.

Tricycles are great for transport. I use them regularly, but I have to carry my wheelchair with me, and that means I need twice as much money for my mobility equipment. It's hard enough for most people to get one or the other—a tricycle or a wheelchair. But have both of them up and running at all times? Also, it's a lot to haul around. It also means you need to park your tricycle and leave it. Some parts might be missing when you come back, depending on where you park it.

So, we need a wheelchair that works as well as a tricycle—that still fits in the outhouse, and the kitchen, and the workshop, but rolls as well as the tricycles do. They're twice as fast as wheelchairs, and you can easily go four times as far before you're exhausted.

They're also much better ergonomically. More than half of us—according to some numbers I've seen—have severe problem with arms, shoulders, wrists. Right now, I'm having a lot. I had it much worse 15 years ago. I adapted, changed my ways of pushing, got some therapy, learned how to work out in various ways. It eventually went away, but it's coming back again. Mostly people I know in our age group, for sure, have occasionally serious problems.

If we could go to lever drives—or crank drives are even more efficient—somehow, but not have the problems that come with a wheelchair, like that they always want to turn downhill, that it's hard to control at higher speeds, that the front wheels are unstable—I think I have a wheelchair base now that I could apply other propulsion to, especially my five or six wheels, where the drive wheels move forward, to where almost all your weight is on the drive wheels, and then a spring-loaded or counter-balanced tail wheel, so you don't tip over backwards because you moved the drive wheels too far forward. Those chairs don't turn down downhill on a side slope. You can coast across a driveway, and come out straight on the other side. With our longer wheelbase and our smaller front wheels, and more rake on the forks, we don't have any more flutter trouble. That's history on good chairs.

06-00:24:02

Bonney:

Would you just move over, so we could take a picture of your chair? Or take a look at what you're talking about all this time?

06-00:24:08

Hotchkiss:

OK. Sure.

06-00:24:22

Bonney: And you have very jazzy green tires. [laughter]

06-00:24:26

Hotchkiss: Straight from Colombia, the tires. There's the latest Whirlwind—lightweight, folding —

06-00:24:34

Bonney: Now, when you say "lightweight"—how much does it weight?

06-00:24:36

Hotchkiss: Well, relatively. Relative to an old hospital chair, it's lightweight.

06-00:24:40

Bonney: Yeah.

06-00:24:40

Hotchkiss: They typically weigh 45 to 50 pounds. This one weighs 35 to 40. This one is 36. These are full-featured folding chairs. They have folding footrests, parking breaks, folding frame, a chair with all of that in the U.S., if it's aluminum—a Quickie, for \$2,000, weighs 30 to 32 pounds, in that range. So we don't weigh that much more. Typically five pounds more, six pounds more. You can get lighter chairs here, in this country, now. But either they cost \$3,000 plus or they don't fold, which is a problem if you're trying to ride in an inner-city bus in most developing countries. You have to fold your chair, and put it under the rear seat of the van bus, in order not to be double, triple fare.

This one balances like a regular chair, but the balance is adjustable, because—like with a good Quickie—I have five positions, front and rear, for my axle. I can tune it. So, each person can adjust it to their needs. This chair is now using all bicycle bearings, which cost—to replace the seal bearings on a typical wheelchair, \$25-50, just to buy the parts. To replace all the balls with bicycle bearings to our wheelchair, under a dollar. So the cost per year of use is much, much less. Front wheels: extra-soft—Zimbabwe wheels, they're called. They're very thin—only a centimeter thick at the middle. They're hollow on the sides. Designed from Zimbabwe push charts that we're very happy with.

06-00:26:51

Bonney: And that lets you go through mud, and sand, and stuff easily?

06-00:26:54

Hotchkiss: Right. They're so wide they don't sink in, and they're so flexible that they roll more easily over rocks. They're bouncy, they're very efficient. They're very strong. They're all rubber, except in the very middle, there's a front hub off a bicycle. Very inexpensive source of bearings and axles. It doesn't matter what I do to it, I've never been able to break these. Just cannot break these. We don't know how long they'll last, but measuring their wear over the years they've been used, it looks like they're going to be good easily for 20 years.

06-00:27:31

Bonney: Wow.

06-00:27:33

Hotchkiss: [inaudible] may need new balls along the way. Axles for rear wheels—about as strong as we can make it. Again, like your chair, an engineered chair, not just a rattle trap Rube Goldberg chair. That chair—every aspect of it was designed with care, and with some kind of attention to detail. The brakes—very easy. Very easy to operate with my little finger, yet once it's activated, very strong. Good for transferring without having the chair roll away.

06-00:28:20

Bonney: OK. Well, thank you very much for that demonstration. Is there anything else, Ralf, that you would like to talk about that we have not discussed?

06-00:28:33

Hotchkiss: Not that I can think of.

06-00:28:36

Bonney: Are we done?

06-00:28:37

Hotchkiss: I think so.

06-00:28:27

Bonney: OK. Well, I want to thank you very much for agreeing to do the interview, and I'm very glad we got it done before you leave for Managua next week. Is that where —

06-00:28:47

Hotchkiss: Philippines.

06-00:28:48

Bonney: Oh, you're going to the Philippines. I'm sorry. Can't keep track of you. But thank you very much, Ralf.

06-00:28:53

Hotchkiss: Thank you.

[End of interview]

Sharon Bonney

Research Interviewer/Editor
Regional Oral History Office
Disability Rights and Independent Living Movement Oral History Series

Sharon Bonney received a BS in Communication and Journalism from the University of Illinois and an MA in Public Affairs from the University of Iowa. After working as a reporter and freelance writer, she established the Services for Handicapped Students Office at Iowa before working in the Department of Rehabilitation as a client advocate in Tennessee.

In 1979, Ms. Bonney became director of the Physically Disabled Students' Program at UC Berkeley for nine years. She later was the assistant director for the World Institute on Disability. Since 1996, she has been an interviewer/editor for the Regional Oral History Office at UC Berkeley for the Disability Rights and Independent Living Movement Project.

Her professional activities include numerous publications on disability issues; founding member, president, treasurer, and conference chair of the Association on Handicapped Student Service Programs in Post Secondary Education (now known as AHEAD); participant in the White House Conference on Handicapped Individuals; and current member of the Society for Disability Studies.

Ms. Bonney has muscular dystrophy and is a wheelchair user.