Oral History of Dame Stephanie Shirley

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Hicks: So I thought maybe I would start off by asking you about your autobiography's title. The autobiography is wonderful, of course. It's called "Let IT Go," or "Let I-T Go," and can you talk a little bit about why you titled this book about your life in a way that showed you moving on, moving away from computing, given that it's about your experience largely in computing?

Shirley: It took me 18 months to write that memoir, and it is a memoir, not an autobiography, and the title took me longer than anything. What would be an appropriate title to encapsulate a long and very active life? The "Let IT Go," with its pun that some people see and some people don't, was suggested actually by my co-author, and-- who's a journalist, and I think it's lasted quite well. But it tries to wrap up perhaps what might be a Buddhist feeling, that life is not just material things, that it is a holistic life, that you can't chop me up in little bits, that I'm not sometimes the businesswoman, sometimes the computer pioneer, the mother, the wife, the mistress. It really tries to pull it all together. I think the memoir has shown the development of a young and somewhat disturbed young person into what I hope is now a serene, mature life, and I've moved to a certain extent away from computing and become really a manager, a businesswoman, and later with the need to care for my learning disabled, autistic son, into really a career, and then a philanthropist. That's now what I do. I try to give money away in a wise way.

Hicks: So you alluded to—in your answer to that question—the traumatic circumstances of your early life, and I don't want to ask you to repeat too much about what you've talked about at length elsewhere, but I was wondering if maybe, from where you sit now, looking back, could you talk a little bit about how that shaped your early life circumstances, shaped your view of technology and politics, if it did. Because I know that you've been very involved, for instance, in the founding of the Oxford Internet Institute, and I'm wondering if you can draw some sort of a through line from then to now or if there's anything important that you think somebody might need to know about how that early experience connects to not just your, you know, the height of your career, but everything that's come after as well?

Shirley: Now Marie, I'm not really going to answer the question that you asked at all. But I would like to talk about how early trauma affects a person and affects their life. I was an unaccompanied child refugee, and that experience has really driven my life. It is as strong today as it was 75 years ago when as a traumatized, weeping 5-year-old, I was put on a train and sent to a strange country with strange languages, strange people, strange parents, strange food. It really was-- it would've been disastrous I think had I not been with my older sister, a nine-year-old who was really not ready yet to care for a younger sibling. But what that two-and-a-half-day transition between Vienna and Liverpool Street Station in London did for me is it made me able to cope with change, and I think that's relevant to my technical career, because I dealt with so much change during that time that I eventually came to welcome change, and so I always want the latest equipment. I'm always an early adopter of something, and it really has helped in my transition from analog computing, from working in binary to the sort of applications that I fringe on today. It also drove my life in that I became really very conscious that my-- how lucky I was to be saved from Nazi Europe, how fortunate I was compared with the million and a half children who were killed during that time, and made me very driven. Each day has got to be worthwhile. I've got to do something better today than I did yesterday. I became a learning person. I'm a perfectionist. I think all these things stem from the insecurity of a traumatic childhood, and finally, I became a patriot. I love my

country, England, with a passion that perhaps only somebody who has lost their human rights can feel. So it's made me a different sort of person, but then life does that to you.

Hicks: Thank you. So moving ahead to your working life and as you're leaving school, you've often talked about how important education is and was to you. But you made a decision, you sort of had to make a decision, to enter the workforce at a pretty early age. Could you talk a little bit about why you made that decision, what sorts of circumstances led to your going to work rather than going to university, and again maybe comment on how that directed the course of your life or how that may have changed your approach to things?

Shirley: As a refugee I was very lucky, but so my life was not, we were not in penury in any way, but we had to watch money very carefully and I was stuck with a sort of insecurity about what I was going to do with my life, where I was going to live, who I was going to live with, if that was relevant, and that really drove me to, I mean, I wanted to go to university. I'm an academic person. I love to learn. I love to do things properly. So I would've liked to have gone to university and for years, in fact, I had a solid chip on my shoulder for not having achieved that. But when the time came I really did not have enough money to even sit for some of the examinations. I took one set of examinations and it cost me four guineas, I can remember, and I didn't do very well in that examination. So shortage of money certainly drove me to sort of say, "I'm going to get into work. I'm going to be self-contained. I'm going to earn my own money," and so I went for a job as a sort of junior mathematical clerk, but in a very fine place. It was the Post Office Research Station. Very fine quality. There were about 200 graduates there. Quite a reputation worldwide, and so I started right at the bottom there and loved it. What happened was that at the age of 23, I had moved ahead because I already had five years' experience of working, and then I got my degree by studying at evening classes, and I think that was the beginning, Marie, of sort of moving ahead. I wanted to be first. I wanted to be in front, and at 23 I was already ahead and I've always tried to stay ahead, keep my brain as sharp as I can, though I notice the difference <laughs> through the years. Forgive me. <laughs>

Hicks: Yeah, it seems like you ended up in an amazing place for your first job. And how did you come to find that first job? Was it a matter of simply knowing that this was a place you would like to apply or answering an advertisement?

Shirley: A lodger that my mother had knew somebody who knew somebody who worked at the Post Office Research Station, and I'd got a similar introduction to another corporation and I had interviews at both. The first one, General Electric Company, was fine and so on, but they were not terribly interested in me, in my future, in my continuing training and education, and so although they offered me a job I went with the Post Office because they clearly were interested in ongoing education. They told me afterwards that I was so insecure that I was asking at 18 about what their pension system was like. So I was really trying to put down roots, which I certainly did at the Post Office.

Hicks: Thank you. Well, I think that sort of transitions well into one of my next questions since you mentioned the issue of pensions and money, and I know that that really differed depending on whether you were a woman or a man at that point in time. The first question I guess I'll ask is when you entered,

since the Post Office was part of the Civil Service, do you recall taking, did you have to take a Civil Service exam, and do you recall anything about it or about it being a different exam for women than for men at the time?

Shirley: Women were quite rare in the public service at that time. We did exist. I was not a first at that stage, but I sort of began to realize that as a pretty, young 18-year-old, life was very pleasant. Everyone, and everyone was male, encouraged me and made a fuss of me and taught me and spent time teaching me things, accepting what my capabilities were, and I love mathematics and I did have some sort of flair for it in those days. I had, incidentally, something called 'figure sight.' I don't know whether anyone has mentioned this to you, in that if I looked-- I was working on a desk calculator or Comptometer, I think it was called, Brunsviga and a strange thing. But I could look at a whole mass of figures and to the irritation of my colleagues, sort of say, "I think there's something wrong there," and be right. That there was something wrong there, and that sort of figure sight goes with the years, and I think by the time I was 30 I'd lost it completely. It makes me think, with my current work in autism, that there's a commonality of picking out patterns and the beauty of patterns, which is why I think we like mathematics, if one does. I've forgotten what your question was.

Hicks: No, that's terrific. So--

Shirley: I know what it was. Hold on. In the Civil Service, you have grades and you have payment according to age. So when you're promoted you start at the bottom of a different scale and then when you get to the top of that scale you're either promoted or you stay at the top of that scale, and I discovered to my horror that the pay scales for women were different and much lower than the pay scales for men, and I was very cross about this. I didn't think it was fair, and I think philanthropy is all about making the world a fairer place, and I began to resent this. When I went for promotion there was also some sexism around in that, at a certain senior level, a group of people who were supposed to be evaluating me on an interview panel said that they would never, ever appoint a woman to this grade, and so there was no point in their sitting on the panel and they stood down from the panel, so there was difficulty in getting an interview, an interview group together. To begin with, it was just, well, that's how life was. I was just so glad to be paid anything and get out of my financial problems. But I then began to be quite resentful about it and quite aggressive about it. So when handsome young men would offer to carry my equipment for me, I would say somewhat, yes, aggressively, "I believe in equal pay and will carry my own things." Because if women want to achieve, we have to perform to the same standards as the rest of society. Nowadays, of course, I just sort of say if somebody offers to carry my things for me, "Oh, how kind. Thank you very much." <laughs>

Hicks: Thank you. So since we're getting into issues of gender and different treatment by gender in the mid-twentieth century, could you talk a little bit more about the decision to use the name Steve initially, and how long or sort of what the thought process was in using that? If you had any misgivings, how long you used it, how you felt about sort of having to use a man's name to try to get your foot in the door and launch your own business?

Shirley: I had already launched my own business when I began to become professional about not just relying on introductions but actually going out and marketing and getting new business, and in a very naïve way I was writing literally dozens of letters, introducing my company's services, and getting absolutely no reply whatsoever, and it was my dear husband of now 50 years who actually suggested, "Well, perhaps it's the name." I was writing with this double feminine, Stephanie Shirley, Shirley being my marital name, and, "Why don't you use the family nickname of Steve?" and so I started writing exactly the same letters, Steve Shirley, and I began to get some replies. This an example of how really, life is skewed a bit for women and we have to learn to cope with it. I didn't find it alien in any way. I noticed that I have of my generation several colleagues and friends who are Joes and Leslies and these androgynous names that could be either. I think they're doing the same sort of thing. I knew one woman in the computer industry, Joan de Smith. It was a sort of double-barreled name, and she used to introduce herself on the phone as "Miss de Smith," and so people thought she was "Mister Smith," and so it's a sort of dodge that people dissemble in order to move their business forward, in order to protect themselves from sexism. There are variety of reasons, and I'm *still* called Steve today. Having got a dameship, a lot of people, it is now, Dame Stephanie, but all my friends just always call me Steve.

Hicks: Yeah. I actually normally go by Mar as well--

Shirley: Yeah. <laughs>

Hicks: --in part for sort of, you know, there are gendered reasons to that.

Shirley: Yeah.

Hicks: But Marie is fine too. It's more of my professional moniker. <laughs> Sometimes it works to have a little edge of femininity as well on your side.

Shirley: Of course. Of course.

Hicks: Which I'm sure we'll talk about a little bit later. So it sounds like when you were using your nickname to sort of gender masquerade and help your business, that you said that you were aware of other women actually doing similar [things]. How common would you say that was during the mid-twentieth century? Was this something that, you know, a significant number of women just did because it was so effective?

<crew talk>

Shirley: A number of women certainly, and I'm just thinking many of them I know of rather than have worked with. One thing I would like to mention is my business was very special. It was a woman's company in the computer industry; 297 of the first 300 staff were all women. I mean, it was really a female-friendly organization. It was set up as a crusade rather than to make money and indeed it took a long time before it did make any money, and I was very proud eventually when it succeeded that I'd set up this special women's company. Again, another first, I thought. Because I have to justify my existence,

and then, almost to my horror, I discovered that there was a lady called Elsie Shutt SHU double "T," on the east coast of America, who had set up, long before me, in 1957-- is that right? Have I got that right? Yes, 1957, a company called Computations, Inc., and that was structured in exactly the same business model, working on the scientific side and never actually getting very big. I did meet her many years later, and she had eventually employed dozen, dozens, of colleagues, whereas I got to eight and a half thousand, you know. It was a different sort of corporation.

Hicks: Maybe this is an unfair question because it's a counter-factual, but I'm going to ask anyway and you can take it where you like. Do you think your business would have become what it did without Steve?

Shirley: Probably not. One needs to make a mark to break into the established world. Something that's different is probably necessary too-- it became a unique selling proposition. We were the women's company, this is what we remember, this is how we recruited, this is what we were, and in the long run it didn't serve us well because people remember us for what we were rather than what we did and we had to really change the culture away from that feminine reactive group to something much more professional.

Hicks: So your startup focused on ensuring that women who had the skills to do this work, to program, would be able to use those skills, and as you've talked about, you accommodated women in many ways that other employers just didn't for decades to come: working from home, part-time work, things like that, And you've alluded to the fact that social justice was sort of a part of the plan all along and I've read elsewhere that you said initially you thought of setting up the company almost as a charity rather than as a company, but then it was explosively successful and--

Shirley: Ho, ho, ho. It was not explosively successful at all. It took me many, many years. <laughs>

Hicks: My mischaracterization. I apologize. I apologize. I was wondering if you could talk a little bit about why, and maybe this seems like a strange question, but why was social justice an important part of the plan for your company right at the get-go?

Shirley: I don't think I was trying to change the world, but I was certainly looking for an environment in which I could thrive professionally and in which others could thrive, and it seemed after working in the public sector, which was fine, wonderful opportunities, and working in a very bright, small company for less than two years, in neither of them did I feel able to reach my potential, and so I decided to set up my own company and so it was a response to an environment that didn't let me and other women do what was in us to do, and certainly it, I mean, I care deeply about other things as well, but women, from the personal point of view, I just felt it-- being subject to anti-Semitism, I didn't want to be a second-class citizen. I wanted all the opportunities that all the guys had got, and so I became quite a feminist in deed, but not in word. I never called myself a feminist because feminism in the '50s and '60s was very anti-male, which I certainly am not, but you needed to get that, the openings and possibilities for women, and I was very much first angry, and then driven to have this crusade to try and make things better.

Hicks: Thank you. And actually, that reminds me of a related question that just came to mind. Since you did have this experience working both in government and the public sector and then working for a time at

a computer company, a for-profit computer company, are there any general comparisons you can make about how women were treated in the public sector versus in private industry from your experience? Was one better or worse in certain ways in terms of gender discrimination or are there any interesting differences there that you'd like to talk about?

Shirley: Because I'm so marketing oriented, you will expect me to sort of say that the private sector was more female-friendly. In fact, I found it was the public sector, because it was all structured and rules so that nobody could sort of say I couldn't do this if the rule book said that I could. In my generation of women there were lots of things that you couldn't do. One college that I attended part-time didn't have washroom facilities for women. My job actually would've entailed me going onto a cable laying ship and I couldn't do that. Women just did not go on working ships. I couldn't work on the stock exchange. I could write software for the London Stock Exchange, but I couldn't actually work there myself. Couldn't drive a bus, couldn't fly an airplane. These were things that were legislative things, and the public sector was very firm on things like that, some of which worked in women's favor.

Hicks: So along those lines of there being certain things women were just legally not allowed to do and if I'm remembering correctly in this period, you know, women couldn't get mortgages in their own name. They would need a male relative to co-sign. So there was this, you know, a real economic factor.

Shirley: But that sort of thing used to make me so angry. "How could you actually demand that I was not able to take my own finan--" I mean, it was, it really made me angry, and I learned to deal with it. Sorry. I interrupted you.

Hicks: Oh, no. No. That's terrific. Is there anything else you would like to say about that?

Shirley: No, let's move on.

Hicks: Okay. Yeah. I interviewed another lady who worked in computing and she made quite a lot of money and because she couldn't get a mortgage she decided to one day just go out and splurge on a new car, so she spent a bunch of money on a new car on her lunch break, and I thought that was really interesting how there were certain things women could spend their money on, but they were not things in which you could sort of invest and build wealth, and so that sort of leads me to the next question about your practice of hiring women and how you prioritized-- I seem to recall you talked about prioritizing how you hired women. So you hired women in particular who had dependent children or who were the primary breadwinners for their family, and then you sort of worked on to unmarried women and the hiring of single women, and so my question there is, and I think that's incredibly admirable and interesting and very-- it's a laser-like focus on social justice, and so I wanted to ask you, in addition to gender and marital status and things like that, were there other categories that played a role in these decisions either explicitly or implicitly? For instance, class or race? Did you ever have any working-class women come to work for you or did you ever employ any women of color in sort of a specific deliberate way or even in a non-specific, non-deliberate way?

Shirley: I think I try to behave like the person that I wish I was or would like to be, and so I really have attempted to respond equally to whoever I meet. I'm the same person, but like Bernard Shaw's "Pygmalion," treat a duchess like a-- no. Forget that. It's such a complex question really. One of my first early staff was an Indian lady, Mrs. Bakaya, who used to always wear the most gorgeous saris, and I don't really know, and when she applied she was competent, we worked well together. The fact that she was Indian was almost-- you look back and sort of say, "Well, in the very early group, there she was." I employed a guy who's since died actually, Sylvan, I've forgotten his surname, who was the first black director in the city of London, I think, and we turned up for some event and I was already sort of unusual-- a woman doing this sort of thing--and then turn up with a black escort, you know, because my husband didn't take part in my business career, and he-- I learned a lot from him and how he dealt with the problems of color. Today it's still, I have, I was walking through Henley, which is a very established city, with an Indian friend some time ago, and people still stared and I thought, "My God," you know, and that was just walking down the street. I don't think I've answered your question. Would you like to repeat it?

Hicks: I think you've answered it pretty well. I was actually wondering though if you-- do you remember the name of the Indian woman that you employed or anything about whether was she educated in the U.K. or did she come to the U.K. from India? I'd love to hear more about her.

Shirley: Her name was Bakaya. I don't remember her Christian name. I don't think I ever knew her Christian name, because in those days life was very formal. Two 18-year-olds sitting in an office would sort of say, "Would you pass me, Miss French, the eraser?" or the machine or the coffee or whatever it was. "Yes, Miss Brook," she would say, handing it over, and it was several years before we sort of said, "Well, when nobody's here, shall we use Christian names?" The world was very, very different and very formal, so I didn't know much about her. She was obviously well educated. I think well educated in India. I really don't know. She had worked with IBM, who were a very good trainer of people in the computer industry. So was competent and was a super colleague. IBM did a great deal for my company in a negative sort of way, because they were sexist and didn't allow women in part-time roles, but they did train them because, again, they were structured. I recruited their rejects avidly, because they were well trained. They were well connected and just there was nowhere else for them to go, simply because they were only working part-time.

Hicks: Yeah. Given that you were recruiting all of these women who had enormous potential, had skills, they had been trained, they could do good work, and industry and government was hemorrhaging this talent, what kind of larger effect do you think that may have had on the British economy in general? Are there connections that you see between what industry was doing in terms of not fully recognizing or not fully utilizing women's potential and what was happening just more generally in an economic sense?

Shirley: I think you give me interests which are not true. I was just interested in getting somewhere where *I* could work, where *other women* could work. I was motivated very much by this fairness and opportunities, chance-extension of people's lives, not the national good. I've done more, I think, by acting as a role model, showing that it could be done. Other people did copy me. Not as much as I would've expected, but there were one or two. ICL, in particular, had a very large group of women working from home, and I eventually head-hunted one of them to head my company. The national impact of women

was much broader than just what was going on in computing. Britain is still, sadly, and it's a country I love, so take it right, but it is still class conscious. There are still remnants of class in some of the things that go on today, and until that is going, we're not going to catch up with the States and everything, but yeah.

Hicks: Thanks. Kind of jumping back a little bit to issues of diversity and identity, one of the most famous programmers at IBM in the United States was a woman named Edith Windsor or Edie Windsor, but she isn't known for her work as a programmer and a manager at IBM. She's known because when her wife died, she took her case all the way to the--

Shirley: Ah.

Hicks: --Supreme Court to get the Defense of Marriage Act overturned because she was not able to inherit her wife's property as a lesbian, and when she was working in the '50s and '60s and '70s at IBM, she wasn't out in the workplace. But there were, of course, a lot of people like her, and I was wondering, since your business was woman-centered, a little bit different in culture, did you know of any lesbians who were either working for you or with whom you worked in other capacities, and if you did, could you say a little bit about that and what that was like in the context of the time?

Shirley: When the company was small, we knew a lot about each other's families. I knew which child had got measles. When it came to gay and lesbian people, we might've guessed--it probably wouldn't have been something that we talked about. It wasn't relevant to our mobility, which was something that we were always very interested in. It's clear that we did attract many lesbian staff, just-- we also over the years, we employed thousands of people over the years, of course--to my knowledge, had two transgender situations. One from male to female; the other female to male. The female to male was the much more difficult to manage the group in the sense of the group dynamics when somebody changed. Because I wanted to do it as well as I possibly could, and I didn't know how to cope managerially with what was going on, I went to the Institute of Directors, which had an HR service and sort of said, "This is happening. How do you advise me to go on?" because there was nothing in the literature or anything, and their response was-- I'd hoped I'd remember the date[1]-- but their response was quite interesting. "Why bother?" they sort of said. "The person will leave the company halfway through the transition and then start again under the new gender in a new employer," and I said, "Oh. But we're a very special company. We really want to make this work. Everybody likes this person. I'm sure we can make it work. Just help me to do it," but they were quite right. In both cases, the person left halfway through the transition and I have lost contact with them. I think the situation is interesting because it helps with-- we have a gender pay gap in the U.K. and I think worldwide that is true. But when you look at some of the gender issues, it's the same person now with a different gender. Their view as to how their employer, how their skills are used and so on, are really quite special and should be listened to because maybe we can learn something from them.

[1] This episode happened on late 1980s [interviewee's note].

Hicks: Yeah. It reminds me a little bit of the case of Ben Barres, who was a cancer researcher. He recently died, but he was, he transitioned at the midway point of his career, and so he understood and talked a lot about how he was treated when he presented as a woman and then after he transitioned he sort of--

Shirley: Would tell you a lot about that social environment of the time.

Hicks: Yeah.

Shirley: Yeah.

Hicks: And what time was that? Was that in the '60s for both of them?

Shirley: No, much later. Seventies and eighties, I think. I would have to think. Seventies and eighties somewhere, yeah.

Hicks: Well, that's fascinating. Thank you so much for talking about that. I think a lot of times that gets lost or submerged in these histories because there is, you know, I think a good-hearted sort of fear of outing people. People don't want to necessarily--

Shirley: That sounds-- nothing to do with me. No?

Hicks: --talk about things maybe they think, "Oh. I don't want to out somebody," but it's so important to see people in the record from the LGBTQ community.

Shirley: Yeah.

Hicks: Transitioning to sort of more of the technical side of what you worked on, what were the most memorable or important pieces of software that either you personally or teams you supervised worked on?

Shirley: I can remember in the early days sitting in my cottage garden discussing with a very senior gentleman from the police force whether I could write software to recognize fingerprints, and I was fascinated. I love to do new things. I love to make new things happen, and really thought about it for some time and had to go back and say, "No. I don't think my company could do this," and it took 40 years for that to happen, because I have seen it now. One of my charities with learning disabled people uses fingerprint technology as keys so the children don't have keys. They use their finger to get into the different areas. So that was a project that didn't happen. The big ones that happened were-- we were lucky. An early project was to develop software standards, sort of management control protocols, and that was wonderful because we were paid to actually—*paid*—to develop the sort of management processes that we should be doing anyway, and we were even paid to update them over the years and eventually those standards were adopted by NATO. Another big one was for [the] black box flight recorder for supersonic Concorde. That was taking analog readings from — altitude, pressure, speed, all

the various things, about-- dozens of them-- converting them into what's called a "best protected black box" or something like that. They're not black, by the way. The only ones I ever saw were yellow, and that was a project that had a team of about 30 people on it. It was led by a woman who's now-- Ann Leach-- now Ann Moffatt, who has been the President of the Australian Computer Society. She was leading that team, and I remember it not really for the technology or the size, but on the financial side, because I didn't get paid for it. I had to turn up and sit on the director's floor for several days. People asked, "What are you doing here?" and I sort of said, "I'm waiting to get paid," and eventually a message came from the chairman, Arnold Weinstock, saying, "Tell Mrs. Shirley to come back tomorrow and her check will be ready," and I got it. Because a lot of things that happen in business have nothing to do with the technology. They're to do with business and people.

Hicks: Well, since you mentioned things going wrong, you know, in the sense that you had to go and be very forceful about getting paid for your work, a lot of times when I talk to folks who worked in computing before it was as stable or as stable as it is I guess now, they have interesting stories about things going wrong, especially hardware faults, but sometimes software faults as well. I was wondering, do you have any weird or sort of funny anecdotes of things that may have gone wrong unexpectedly early on?

Shirley: If I have, I've forgotten them. I remember we used to record the mean free time between faults of the computer system that we were working on, because it was failing. We were testing software on it when the hardware itself was failing--and it made life pretty difficult, but I don't remember anything funny about that. I just remember having to struggle through it. So sorry.

<laughter>

Hicks: No, that's fine. I relate to that. I used to work as a UNIX Systems administrator and I used a lot of trash hardware and so a lot of times it was about troubleshooting the hardware in addition to the software, and it was just a mess. Not too much fun there. <laughs> So I appreciate that. Would you say, is there some sort of general theme or character to the types of projects that you took early on? In other words, you know, your company had this very strong social justice mission in terms of hiring. Was there also some sort of similar mission in terms of what projects you were taking?

Shirley: My interest was scientific, but the market such as it was--and most people didn't value software, they thought that hardware was much more important--but the market such as it was, was commercial. Big projects that were available were things like payroll, which, apart from the size of some of the files, I found not particularly interesting. So I hit a compromise with operations research, and one of our early clients was a company called Business Operations Research. I'm still in contact with the individuals, who were operational research consultants, and helped us by feeding in a-- in fact, they eventually offered to take over the company, and we developed a specialism in operations research. It was the time when scientific stock control was just coming in. We did one stock control and then another stock control, and then lots and lots of stock controls, and we were doing logistics stuff, scheduling freight trains for British Rail, timetabling coaches, that sort of job, and that kept some sort of scientific interest going. We had a scientific division, which did a lot of public service work, which we eventually closed down simply because we couldn't make it profitable. I think the specialism was in operations research work. Later there were

other specialisms. Trying to think what they were, but a lot of banking work. The telecom side disappeared, although I came in from telecommunications. I mean, I got into computing with telephone exchanges and things like that. I was very fortunate, which I should get on to the record, I suppose. One of the bosses that I had was Tommy Flowers of Bletchley Park codebreaking fame, and not only was it a privilege to learn from him, but he was an extraordinary manager, and in the sense that I had a role model, I think on reflection I probably would emulate his very gentlemanly, soft style, which perhaps today might be called a feminine style.

Hicks: At that point in time I know he didn't speak about what he had done in the war for decades.

Shirley: Yeah.

Hicks: But how aware were you, if at all, about the importance or the fact that he had done something very important during the war?

Shirley: At the time, he was--

Hicks: Yes, at the time.

Shirley: Yeah. No. At the time, he was just a, you know, a very, very super guy that we knew had done something clever or something and was gorgeous to work with. Afterwards, he wasn't recognized nationally in the way that I have been, for example, which was really quite a disgrace. Partly because of the Official Secrets Act. But a group of people, of whom unfortunately I was not one, but a group of people thought, "Now, what can we possibly do now in retrospect?" and they got a little road near the Post Office Research Station, renamed Flowers Close, which means Small Road, and that was our tribute to him. The Institute of Electrical Engineers, which has now changed its name to something else, has a room called the Tommy Flowers room and I came across that recently when I was in <laughs> the building. So I think most people now recognize the contribution that he made. He was, I think, a brilliant scientist, but also an extremely good manager.

Hicks: It's sometimes rare to see the two go together, so having his example and having you, it's so nice to see those two things together--somebody who's excellent with people and also excellent technically. A little bit earlier in the conversation, you talked a bit about professional norms and how that hooked into the gendered mores of the time and so on, and I was wondering if you, because this is still an issue that women and people of other genders are struggling with today, if you could talk a little bit about the struggle to be seen as professional and taken seriously and how much you sort of tried to fit in versus how much you tried to do things your way and transcend the professional norms of the time, and if you could kind of talk about how that changed over time, like, if it was different in the '60s versus the '80s?

Shirley: I tried to merge into the male background, not to stand out. To the way in which I dressed, and I was very short of money even once I started working, so I had very few clothes, but it was very much gray with the equivalent of a male suit, I suppose. That has sort of stuck with me. My company, we started in 1962, so in the '60s, again, we encouraged them to have a style, a way of behaving. For a long time we

didn't, we said, "no trousers." Because we felt that would aggravate the men, because they wanted us to be feminine, so we certainly had that as a house rule. Well, it wasn't written, but I remember we had one party and I'd given a reminder about suitable dress and somebody took exception to this, so they turned up in what was it? A sort of long skirt. Absolutely lovely. Very elegant. Lovely woman. Don't remember her name, and then halfway through the evening she took off her big skirt and she'd got tiny little shorts underneath there, <laughs> and my, I was not pleased! So there were things that went on with dress that were pretty important to how women were seen. Back in the mid-'80s, I can remember recruiting for a finance director who would be finance director as the company went on to the main stock exchange, and I had women come forward with little dresses with puffed sleeves and a décolleté, lovely, pretty things. Now, but, you just look at them and you say, "In no way am I having her represent my company in the city of London." So women still have a lot to learn about how to present themselves. We don't have to dress in male uniform anymore, as I did in the '60s, but I think we do have to look professional and have--not a house style--but a self-confidence that means we can dress as we want to. If I want to wear red, if I want to wear trousers, or if I want to, you know, I just wear what I want to. I've just concentrated on clothes, which I love, of course. But there was more to that question. What was the other thing that you were asking?

Hicks: No, I think it's very much about clothes and what they mean, and I wanted to ask you something about the trouser suit ban or informal ban.

Shirley: <laughs>

Hicks: I get what you're talking about. It sort of upset the men you were working with, upset gender norms, but could you--are there any personal examples you could give--where you *saw* men react in ways that led you to say, "Okay. This is why we can't present ourselves in that way?" Are there things that you could maybe give us examples of that would allow, say, a young woman in her college years or her twenties today, to understand what that was like at the time?

Shirley: I think I'm going to skip that question because I can't think back to that culture really.

Hicks: Sure. No worries. Do you happen to remember when the trouser suit lost its negative connotation?

Shirley: Mid- to late-'70s, and I always wear trousers now. They're so <laughs> much more comfortable than skirts. Are you in a trouser suit? Can only see the top of you.

Hicks: No. I'm wearing a skirt.

Shirley: Yeah.

Hicks: But you can see, I'm doing the--

Shirley: Yes.

Hicks: --you know, the gray jacket.

Shirley: Black and white. Yes. <laughs>

Hicks: So at a certain point-- you've talked about--in other places--how being technical, obviously, was not the be-all-end-all of what you did, and in particular in this period, in this earlier period, being technical could even be a way to have other people in positions of power discount how much you knew or how much you could do. You, for instance, couldn't transition into marketing or management--

Shirley: No.

Hicks: --because the idea was you were just, you are a technical person, you take our instructions, you code the program. And you diversified so that you had a business that was more about management consulting and systems analysis, so that you and your company would not just get stuck as being seen as coders, and I was wondering if you could tell me about what that process was like, moving--in a sense--up the power chain in order to be in a position where you were not just building infrastructure but you were in a sense calling the shots about exactly how that infrastructure might be designed for a company or even for the government.

Shirley: I think there are some gender issues involved in this, because as the technical work started, it was considered to be very much a woman's role. We were anxious not to tread on male territory because we knew that was dangerous. We moved from coding programming-- I mean, I started, my company was originally called Freelance Programmers. We only became Freelance Programmers Limited later, and then we-- programming began to be synonymous with coding, and so we moved to include systems analysis, set up a new company that just did systems and consultancy and started moving up there. When it came to moving from technical to management it was a different issue. It was a question of leaving an area in which you were--excelled or were at least competent--and moving into an area in which I knew I was incompetent. I'd had no training, there wasn't-- I read books a lot-- but there wasn't anything that really referred to service companies, what books I had, and I had difficulty in getting help and advice on that. So it's a difficult transition that most people don't make happily. Many people opted out of the management role. My company eventually had dual career paths where you could either go up the management track or actually stay as a consultant. So it was something that had to be managed, but you're quite right. I did turn into a manager. Such knowledge as I have of the technical world is purely of interest and very superficial and lay. What I've become is some sort of a manager.

Hicks: Yeah. Do you have any thoughts on how the, you know, the status of technical work has really risen over the course of the 20th and into the 21st century to the point where now at least in the United States in Silicon Valley, being technical is an entrée into powerful roles, into management roles, in a way that it really wasn't in the mid-20th century? Do you have any thoughts on that, on that change?

Shirley: I can remember talking with a banker and saying sort of, "Oh. You know, we're a technical company," and he corrected me and sort of said, "All companies are technical now," which was probably certainly true of banking, and I think this is what's happened with management. We all have to appreciate

the potential and the understanding and the strategic uses of technology, even though we may or may not be able to still code. There's a movement in Britain to really get women, to get children, sorry. To get children learning to code much, much earlier, and it's quite clear that one can encourage that sort of discipline in very, very young children, and to discourage women from leaving the technical world which they find too nerdy, and, of course, they then shut off routes of their careers in the future by losing their technical expertise.

Hicks: What are your thoughts on these coding boot camps or these learn-to-code initiatives which have actually been around for decades but they've become newly popular in the past decade or so? What are your thoughts on those?

Shirley: Well, I'm out of date. Don't get me wrong there. I've never been to one of these things. I don't really know anything about them. Seems to me if I want to go to a camp and learn how to ballet dance or go to a camp and learn how to code, seems to be absolutely fine. Why not? And so much of, you know, so much of one's life is spent working, but when it is a joy and a pleasure, I could never believe that I should be paid so well for doing something that I enjoyed so much, and that's how work should be, and it can be in the technical world.

Hicks: Well, on that note, if you hadn't gone into computing, what do you think you would've ended up doing? What would you have devoted your life to?

Shirley: You know, I've never been asked that before. What would I be? I wanted to be a ballet dancer. I think I wanted then to be a mathematician, to solve something called Fermat's Last Theorem, which took another 40 years to do. So I would've been a pure mathematician, probably academic. I would've enjoyed it, I'm sure. But I don't really think I had it in me to contribute at that sort of level. I'm much better off in the real world, and I've had a wonderful career. I hope it's not quite finished. As I say, I'm still an early adopter. I'm using a small robot to teach autistic children, for example, and I'm very proud of that, because I can still see that these are opportunities for things that I want to do in a very modern, 21st century way.

Hicks: Would you talk a little bit more about your experiences with philanthropy related to autism and especially about the role of technology in helping folks who have autism or who have other disabilities?

Shirley: How long have we got? <laughs> Because that's now what I do... Autism is a strange disorder. It's known to be genetic, but we don't really know very much about it. What we do know is that it's difficult to deal with, and difficult for the people with autism. I've set up several charities in the autistic field and so my experience is through them. A child that is dashing about in all directions could well today be wearing a Fitbit bracelet to see what's going on there. Could well be monitored how they're sleeping, when they're sleeping and so on. Could be using, I think I mentioned earlier, fingerprints as access keys, because child protection is very important with these very, very vulnerable pupils. Many of them are using iPads to communicate with, and back in 1982, I remember the year because it was a year, the International Year of Disabled People. I was starting to talk about using computers as a communication aid, as distinct from process control or calculations, I mean, used by the blind to speak, the deaf to hear,

those communication [aids]. Communication is very vitally important for people with autism, so there's a whole host of things. The technologies are opening up new things for people with autism.

Hicks: One more question about, I guess, technical aspects before we move on to the final phase of general reflective questions. You had mentioned the computerized fingerprint system that you ended up, you know, considering building but realizing the technology wasn't really there and you declined it, and there's a lot of, of course, really, really powerful, important things that technology can do to keep track of people, and sometimes this can be used in ways that are not necessarily good. So for instance, you know, recently in the United States, IBM and other companies have been asked to come out and say things like they won't use their technology to build a registry of Muslim people living in the United States. Were you ever put in a position where you either didn't take a job or you maybe did a job differently because of the way you understood the technology's potential to do harm? Were you ever in a position like that?

Shirley: These issues are not particular to technology. You're fringing on corporate governance and ethics, and yes. Over many years in business there were many occasions when we had to refuse work or in one case I blew a whistle--you know the expression "whistle blowing?" -- saying that something was going wrong, in the public sector. We never <laughs> did any more work in that sector any more, but I blew the whistle and stopped it. So, you know, yes. In one's professional career I think one has to use the same values of responsiveness, of truth, that one does in everything else, and I don't think the technology, per se, comes into it. All the things that we do in business, that we do with children, that we do in our lives, that we dream about or fear, all these are relevant to technology.

Hicks: So like many successful businesspeople, you've sort of had to walk this fine line between fitting into existing systems and using existing systems to your benefit and then also being willing to break the rules and go beyond what exists at that time to build something more and to do something new, and so I guess this question is just sort of a, you know, personal question. Would you characterize yourself at heart as somebody who's more rule bound or more of a rule breaker? How do you think of yourself?

Shirley: Oh, I'm definitely rule breaker. <laughs> I've been called disruptive, and the first time it was, the term was used, I thought they were being rude or something, but yes, I'm disruptive. I-- partly because I have not been educated as much as I would've liked. Certainly in business, nobody told me the things that I wasn't supposed to do in business, so I just went ahead and did them. So I broke a lot of rules because I didn't even know the rules were there, and I think that's quite healthy if you're interested in innovation.

Hicks: I think it definitely seems to help when you look around at who's really made big marks in the industry and in the world, and, you know, as a prominent woman in the field of computing, you've obviously become a role model for a lot of people. You know, you've become, from your work in the 20th century and in the 21st, but, you know, especially from your early work in the 20th century, you've become sort of this 21st century role model, and I guess I wanted to ask you, since you are such a role model, to women who are just starting out in industry or in their education today, what do you think are the major

global events that are going to shape young women who are, say, coming into the field of computing today?

Shirley: Well, I'm trying to think on a world basis, and there, thinking of the developing world, the real important thing is birth control. Made such a difference to women in the 21st century. Everything changed once you could control your child-bearing, and that still applies on a world basis, and I guess in parts of the States. North America, at least.

Hicks: A couple of times I've heard you referred to as the Grace Hopper of Britain, and I know you've met Grace Hopper--

Shirley: Yes.

Hicks: --once or twice, right?

Shirley: What I remember of meeting her was something ... that we were talking about women going on working, and she was very polite about my achievements and she sort of said that she had made a choice early in her career to remain at a professional level, whereas her sister, of whom I'd never heard previously, had made a different decision and had retired into domesticity as a mother, as a wife and mother, and I sort of thought how sad it was that for so many years women had to make a choice, either/or, without realizing that they could do both.

Hicks: So Grace Hopper, of course, has this very prominent legacy. You know, she's got this conference that tens of thousands of people go to each year that's focused on solidarity for women in computing professions, and there are, of course, a lot of wonderful things about that and then I'm sure there are some things that were she around today she would say, "I'm not really too into that aspect." If you got to fully define, you know, your legacy, what would you want to make sure it conveyed and looked like and is there anything in particular you would want to make sure your work didn't get used to support or that your legacy wasn't read in a particular way?

Shirley: We all have to remember that technology is neutral. It doesn't have good and bad features to it. That only comes from its usage, so when it comes to the technology it's there and I would always want to improve it and cheapen it and speed it up and improve it and modify it, because that's what I think is the best thing. My legacy, and as you get, as one gets older, one becomes more and more conscious of legacy, I'm sure is one for women rather than technology. What I did in the field was absolutely trivial, but I was one of the first to move from, to see technology not just as something technical but as something that was social, legal, ethical, economic, and in that sense, that is my legacy.

Hicks: So before we break, I was starting to ask you a question about your founding of the Oxford Internet Institute. I was wondering if you could talk a little bit about that and what about their mission do you think is so important and what have they done so far that you are proud of or what do you hope they might do in the future?

Shirley: The idea of the Oxford Internet Institute was not mine. Somebody approached me and asked for my involvement, and I explained that I wasn't really in computing any more, it was-- and they made the issue, they made the point that it was appropriate in my philanthropy for some of the wealth that had come from the computing industry to be reinvested in the industry and I was persuaded to do it and I'm very glad that I did help them. I served on their strategy board for 10 years as well. It extended this concept of thinking of the importance of technology from the point of view of its capability, of it's potential, of the doors that it opened, of the windows-- I'm getting metaphors mixed up, aren't I?--but of its potential, socially, economically, legally and ethically, and I have been delighted with its progress. Some of the things that it did in the early days were very basic but needed doing. They started keeping a record of how the internet was used. So they have very-- how long have they been going now? Getting on for 15 years at least. So they have very good records. They're considering at the moment the issues of-- what's it called? Sorry. See, I am getting tired. People getting, not obsessed, but getting locked into the technology and can't make human relations anymore because they're so embedded into the technology. They're looking at humor on the internet: is that different? So it's a whole range of things that the researchers want to do, and researchers are at a very high level. Several, and I've forgotten the number -- I think it's 12 professors already -- who come in with their own interests, they have looked at women and the Internet. When I set up a charity, my aim is always to have it freestanding and I back away as soon as I can, and that's one of my strengths. I go there once a year. I've got a date in my diary because I want to pick their brains about something, but I'm very proud that it should be now one of the leading international research institutes in the world, and I think, "Well, yes. My little part was helping it get going."

Hicks: Were you involved at all in the naming or could you talk about why it ended up being named the Oxford Internet Institute rather than the Oxford Computing Institute or Computing and Society Institute or something like that?

Shirley: Yes. I was very involved at that sort of level, at that sort of time, and we had endless discussions, names, as I mentioned, about the title of my memoir. Very difficult and they're very important and we did have major discussions about what it should be called. It is quite significant that the word computer does not appear in the title. It's very significant. At one time we talked about not having the word Oxford, and an outsider sort of said, "It's got to have Oxford," because that starts it off with some status. But yes. It is significant. The OII is particularly pleasant because you can play with nought—one--one, this sort of thing. It became part of its public image.

Hicks: I didn't even think about that little sort of--

Shirley: Yeah.

Hicks: -- binary--

Shirley: Yeah.

Hicks: --pun.

Shirley: Yeah.

Hicks: What do you think of your portrait that's hanging in Balliol College? I saw it recently.

Shirley: I've done several things for Balliol and I've got a current project now which is in fact life histories of its masters. But I was nevertheless astonished when the master of Balliol said that they would like to do a portrait of me. I'm astonished how big it has turned out to be. My husband doesn't like it. He thinks it makes me look much older. I like it very much. I think it brings out some of the distinctive characteristics. In particular, I'm holding a geometric solid which is reminiscent of the Jewish star, I suppose, which is what I was trying to evoke there, and of course, I'm holding a tablet. Did you pick that up? So it tries to--

<laughter>

Shirley: That's me.

Hicks: Did you have a role in saying what those artifacts that you were holding were?

Shirley: Oh, those sort of artifacts come with endless discussion with the artist, who's, Saied Dai, who's also a refugee. So we got on very well, not because of that, but we've become friends. It's a very intimate thing having your portrait done, and I'm very proud to have it hanging in Balliol. It is very--I won't say pleasant--I find it significant how at my age now I'm getting so many honors. I'm so delighted to be recognized by the National Museum of Computing. I'm conscious that these accolades are sort of flooding in on me at the moment, but I have time. I enjoy them. It acts, I serve, as a role model. That's my role in the computing industry at the moment. If I can help today's women, that's what I want to do.

Hicks: Along those lines, what would you say to a young woman or maybe a young genderqueer or non-binary person who's in the field of computing today? Maybe a student, maybe just starting out, maybe mid-career, but they're thinking of leaving because they feel like it's not going well for them or they don't fit in. Would you have any advice to give them in a direct way?

Shirley: Well, my advice is always to the employer. If women are leaving like that, you have to do something about it and that means things such as holding what I call "stay interviews." That you interview women, and even perhaps all young people, "How are you getting on?" This is what we-- that you don't wait until they're leaving and discontented. As far as individuals are concerned, the world is open, especially with technical skills. If an employment, if something doesn't work, then go out and find something else in the world to do, because we've got-- we spend a lot of time at work, and if we don't enjoy it, life is pretty gray, and that's not necessary. If it doesn't work, go and move — move! With any project, you go under it or through it or around it or over it. Just do something else!

Hicks: I bet that's advice that a lot of young women would like to hear now because a lot of folks who have talked to me about my book, they -- I'm shocked -- they always say things like, "Oh. What you're describing in the '50s and '60s, it's so similar. I feel it's so similar to how we're treated today," and they

feel an enormous sort of guilt about leaving a field in which women are underrepresented because they sort of feel it's their duty--

Shirley: <laughs>

Hicks: --to stay. But it sounds like you're saying, "Don't feel that way."

Shirley: I am very, very disappointed how little the gender issues have moved on over a very long lifetime. But there it is. We've got to be realistic, and the world is open to all of us.

Hicks: I think that's a message that will help a lot of folks. As you have been getting all of these accolades and you are cementing your position in computing history, I was wondering if you could talk about what you think is still left out of computing history. Are there things that you feel are under-discussed or under-studied in computing history that you'd like to see us talk more about?

Shirley: Well, under-studied is analog computing. I mean, I can remember in the '60s, serious discussions as to whether the computing world was going to go analog or digital and the decision quite clearly and rightly was it went digital. But what happened to analog? It must've progressed. It must still be in use in certain processes, and one never really sees anything about it. Does one have mixed computing systems of which I know not of? These are areas where, again, I'm jumping outside the rigid boundaries of digital computing and saying, "What else is there?" Are there new input devices that are quite, quite different to what we've got at the moment? I mean, I can remember when we had keys to get in and so on. It's-- I think to broaden some of the issues, the gender issues I think will resolve themselves in the next generation. They must do, they must resolve. So, you know, I think I would want to develop some of the holistic ideas of computing rather than the narrow processes of faster, better.

Hicks: Jumping off of that, what do you think are the biggest problems vis-à-vis technology that are facing, let's say, the U.K. today, and what do you think are the areas of greatest promise?

Shirley: Well, let's take the second first. Artificial intelligence, I think, is the area of greatest promise that I know of, and you said something earlier about my compu-- I'm not in computing anymore now. What I am is I work in autism. I know quite a bit about that. But I do view artificial intelligence not as something that is just today's technology, because we *were* working on it about 15 years ago, 1998 I was doing things that I can clearly see tie up with some of the A.I. stuff today, and it is just at the beginning and I do believe it's going to make a great difference in the world. I do believe that some groups have the responsibility of making sure that it is not too divisive in the world, the haves and the have nots. I know I'm not one of those, but I can see not only the dangers but I also see all the possibilities, the potential. I think it's going to be terrific. Now I've forgotten what the first bit of your question was.

Hicks: Oh. The first was just kind of the other side of it. Are there any--

Shirley: Oh, the U.K.

Hicks: --problem-- oh, sorry. Could you not hear me?

Shirley: No. I've just forgotten in a senior moment. In the U.K. I don't think I'm competent to judge that.

Hicks: Just a couple more and then <laughs> I'll let you go. I know we've kept you a while. This is sort of a more general question because it's related to some of the questions that the Computer History Museum wants me to ask. Why do you think computing history is important? If there were somebody who is not technical, who doesn't really understand computing, what would you say about why they should care about the history of computing?

Shirley: I think any historian bringing their disciplines into the world of technology really has a lot to give, because it is not only strategic in world affairs but it's also moving very fast and you can see the difference between the sort of programming I did where I would get two turn-'rounds on a computer a week compared with what's going on in my Apple watch, and it just seems like a different world, and it's still moving faster with just the beginning of that growth curve, I believe, and so we have to capture it. Make sure that we know, partly to learn, somehow not to repeat yesterday's mistakes. But we really have to record for national and international reasons what has happened and is happening, including the things that didn't work, because a lot of researchers only talk about the successes, "Oh, I did this and I did that" and they don't talk about the 17 other things that they tried and didn't work or went wrong, and to record that is a very valuable input, and that's why people are prepared to give time to the Museum. I mean, the Museum's got some of my work papers, for example. Now, they're there. They get more and more interesting the older they are.

Hicks: Given all that, if you were visiting a computer history museum or maybe if you were taking friends to a computing history museum, what would you like to make sure that museum did that maybe they don't do already?

Shirley: Oh, I think it's the emphasis on software, which is very hard to demonstrate but it has to be software and the man-machine interface and so on, most of which is ignored. It's just all hardware. We have a very small computing museum in the U.K., in which I appear, so I'm a museum piece already, but the emphasis is very much on hardware.

Hicks: Do you have any thoughts about how one could make an engaging a museum exhibit about software given how sort of ephemeral it is?

Shirley: I would think using something like virtual reality.

Hicks: Thanks. Well, just I guess one last question before we go. In the U.S. at least, in Silicon Valley, I'm sure you've heard there's sort of this moment of reckoning as regards sexual discrimination, sexual assaults, sexual harassment, and you mentioned a couple of times that for instance, you said, while pitching a piece of software or trying to get a contract, that a high-level government minister had pinched your bottom at one point, and I was just wondering, given your experience and seeing what's going on now, what's your response or what's your feeling about how things have changed? Or haven't.

Shirley: Well, I don't think they've changed as much as one would've hoped. They have changed enormously from my youth when we were second-class citizens, we were disallowed from certain things, important or unimportant. Today, women are-- and again, worldwide, it's very, very different... I... I think we still have a long way to go. Some of today's issues are-- I think they're trivial. "Why is it worth speaking about that?" But some of them are not trivial. They're very important. They attack people's very being, and it is right and proper that women should, whether individually or groupwise, really address these issues and say, as my family's saying, "Up with this I will not put."

END OF THE INTERVIEW

