RICE UNIVERSITY'S BAKER INSTITUTE FOR PUBLIC POLICY
& SCIENCE HISTORY INSTITUTE

HAROLD T. SHAPIRO

PCAST

Transcript of an Interview
Conducted by

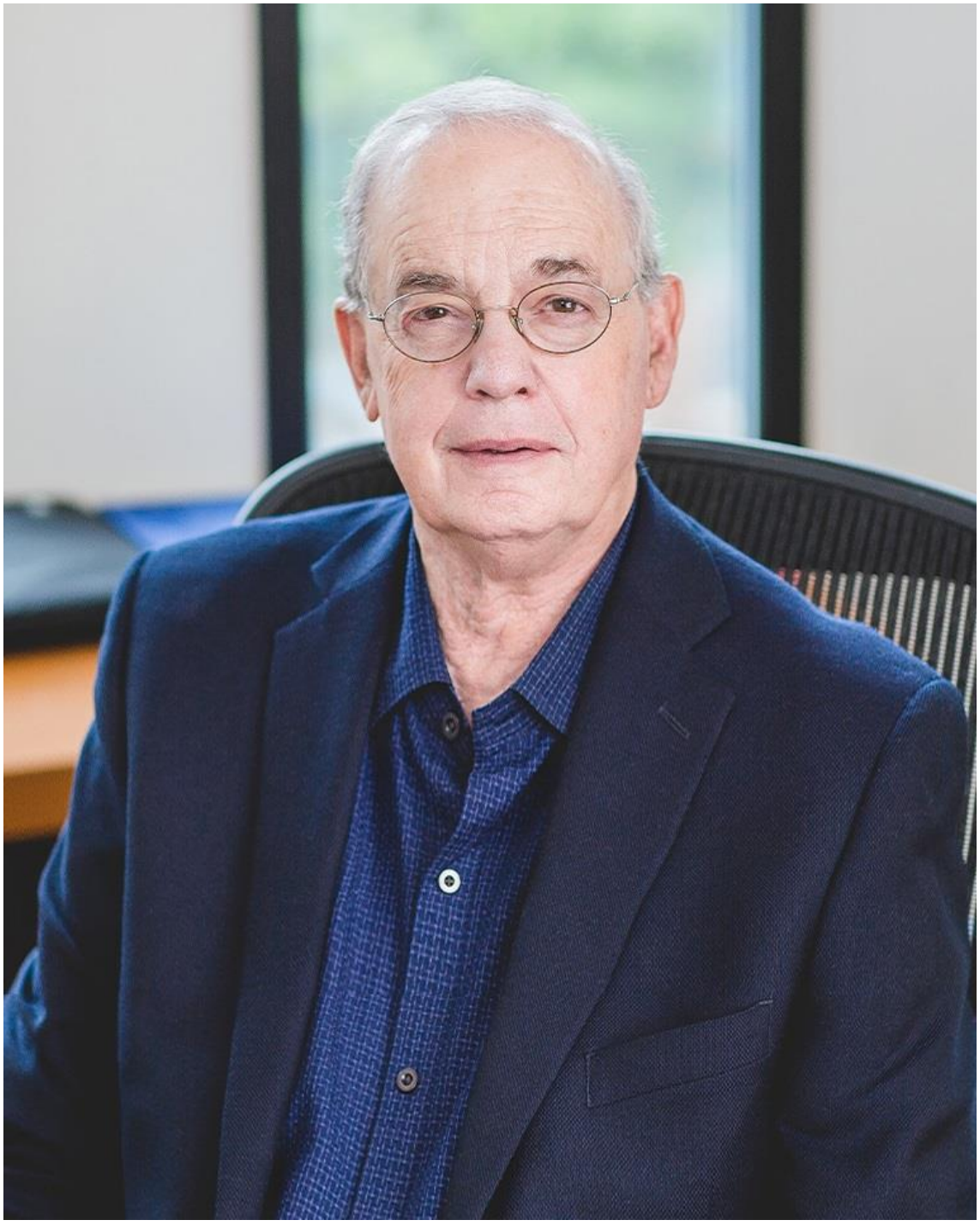
David J. Caruso and Kenneth M. Evans

via Zoom

on

15 February 2021

(With Subsequent Corrections and Additions)



Courtesy of Harold T. Shapiro

Harold T. Shapiro

ACKNOWLEDGMENT

This interview is part of a research project "The President's Scientists: Understanding the Role and Full Impact of the President's Council of Advisors on Science and Technology (PCAST) Through Oral Histories." Funding for the project was provided, in part, by a grant from the National Science Foundation (Grant No. SMA SBE 1854055). Additional support for digital archiving was provided by the Baker Institute Civic Scientist Program, The Richard Lounsbery Foundation, and Humanities Texas, the state affiliate of the National Endowment for the Humanities.

SCIENCE HISTORY INSTITUTE
Center for Oral History
FINAL RELEASE FORM

This document contains my understanding and agreement with the Science History Institute with respect to my participation in the audio- and/or video-recorded interview conducted by David J. Caruso and Kenneth M. Evans on 15 February 2021. I have read the transcript supplied by the Science History Institute.

1. The recordings, transcripts, photographs, research materials, and memorabilia (collectively called the "Work") will be maintained by the Science History Institute and made available in accordance with general policies for research and other scholarly purposes.

2. I hereby grant, assign, and transfer to the Science History Institute all right, title, and interest in the Work, including the literary rights and the copyright, except that I shall retain the right to copy, use, and publish the Work in part or in full until my death.

3. The manuscript may be read and the recording(s) heard/viewed unless restrictions are placed on the transcript as listed below.

This constitutes my entire and complete understanding.

Signed release form is on file at the Science History Institute

(Signature) _____
Harold T. Shapiro

(Date) _____ Dec. 13, 2023

OPTIONAL: I wish to place the following restrictions on the use of this interview:

_____

_____

I understand that regardless of any restrictions that may be placed on the transcript of the interview, the Science History Institute retains the rights to all materials generated about my oral history interview and will make the title page, abstract, table of contents, chronology, index, et cetera (collectively called the "Front Matter and Index") available on the Science History Institute's website. Should the Science History Institute wish to post to the Internet the content of the oral history interview, that is, the full transcript and/or recordings, direct quotations, audio clips, video clips, or other material from the oral history recordings or the transcription of the recordings, the Science History Institute will be bound by the restrictions for use placed on the Work as detailed above. I understand that in the absence of such restrictions, the Science History Institute will make the full transcript and recordings available online in accordance with its established policies.

I understand that the Science History Institute will enforce any restrictions until the time of my death, when any restrictions will be removed.

PERMISSION TO POST COMPLETED ORAL HISTORY TRANSCRIPT AND/OR INTERVIEW RECORDINGS ON THE INTERNET

The original release agreement that you signed with the Science History Institute, which governs researchers' access to your oral history, either made no mention of posting your entire transcript and/or interview recordings on our website or stipulated that we would seek your permission before posting the full interview. It is our goal to broaden individuals' access to the Science History Institute's oral histories generally, and your oral history specifically, so we are contacting you to request permission to post your entire completed transcript and interview recordings on our website, located at http://www.sciencehistory.org and on the Science History Institute's Digital Collections website, located at https://digital.sciencehistory.org/. To be clear, if you requested that certain sections of your interview be restricted or sealed, they will not be included in the material posted to the Internet and will remain restricted/sealed as outlined in the original release agreement.

Should you choose to grant us permission to post your entire completed transcript and interview recordings, the Science History Institute will not be able to limit anyone's access to or use of your oral history in any way outside the bounds of U.S. Copyright Law under title 17 of the United States Code.

If you have any questions about this form, or if you would like to review your original release agreement, please contact the Director of the Center for Oral History at oralhistory@sciencehistory.org; (215) 925-2222; or Director, Center for Oral History, Science History Institute, 315 Chestnut Street, Philadelphia, PA 19106.

HTS
Initials

I, Harold Shapiro, GRANT exclusive permission to the Science History Institute to post my completed oral history transcript and interview recordings conducted on 15 February 2021 with David J. Caruso and Kenneth M. Evans via Zoom on the Science History Institute's website.

_____
Initials

I, Harold Shapiro, DO NOT GRANT permission to the Science History Institute to post my completed oral history transcript and interview recordings conducted on 15 February 2021 with David J. Caruso and Kenneth M. Evans via Zoom on the Internet during my lifetime.

Signature: Signed release form is on file at the Science History Institute
Interviewee's Name

Dec. 13, 2023
Date

This oral history is designated **Free Access**.

RICE UNIVERSITY'S
BAKER INSTITUTE
FOR PUBLIC POLICY

Science History Institute
Chemistry · Engineering · Life Sciences

Rice University's Baker Institute for Public Policy is a nonpartisan public policy think tank focused on the most pressing policy issues facing our country and the international community. Located in Houston, Texas, the nation's fourth-largest city, the Baker Institute brings a unique perspective to some of the most important public policy challenges of our time. Key research programs include health, energy, the Middle East, Mexico studies, public finance, entrepreneurship, and science and technology policy. For more information visit bakerinstitute.org.

The Science History Institute collects and shares the stories of innovators and of discoveries that shape our lives. We preserve and interpret the history of chemistry, chemical engineering, and the life sciences. Headquartered in Philadelphia, with offices in California and Europe, the Institute houses an archive and a library for historians and researchers, a fellowship program for visiting scholars from around the globe, a community of researchers who examine historical and contemporary issues, and an acclaimed museum that is free and open to the public. For more information visit sciencehistory.org.

HAROLD T. SHAPIRO

1935 Born in Montréal, Quebec, on 8 June

Education

1956 B.Comm, McGill University, Commerce
1964 MA, Princeton University, Economics
1964 PhD, Princeton University, Economics

Professional Experience

University of Michigan
1964-1967 Assistant Professor of Economics
1967-1970 Associate Professor of Economics, Director of Graduate Program
1970-1976 Professor of Economics
1976-1987 Research Scientist, Institute of Labor and Industrial Relations & Institute of Public Policy Studies
1977-1987 Professor of Economics and Policy
1977-1987 Senior Fellow, Michigan Society of Fellows
1977-1979 Provost
1979-1988 President

Princeton University
1988-2001 President
2001-present Professor of Economics and Public Affairs

President's Council of Advisors on Science and Technology
1990-1993 Member
1992-1993 Vice Chair

National Bioethics Advisory Commission (NBAC)
1996-2001 Chair

Honors

1989	Elected Member, Institute of Medicine of the National Academy of Sciences
1990	Elected Member, American Philosophical Society
2000	Fellow, American Academy of Arts and Sciences
2000	Citation for Outstanding Leadership, Council of Scientific Society Presidents
2000	Fellow, College of Physicians of Philadelphia
2001	Active Member, European Academy of Sciences and Arts
2003	Clark Kerr Lecturer, University of California
2006	William D. Carey Leadership Award for Leadership in Science Policy, AAAS
2006	Fellow, American Association for the Advancement of Science
2009	Clark Kerr Award for Lifetime Achievement in Higher Education, University of California, Berkeley
2012	National Academy of Science Public Welfare Medal

ABSTRACT

Harold Shapiro was born on June 8, 1935, in Montréal, Quebec. His father immigrated to the United States from Odessa, Russia just prior to World War I as a metal worker, but spent most of his adult life as a bootlegger, moving to Canada likely to evade the Federal Bureau of Investigation (FBI) during prohibition and starting a large, successful restaurant business. Shapiro had an identical twin brother, Bernard J. Shapiro. Although they had different interests as children, they eventually grew to be very similar in adult life, both serving as university administrators. Shapiro's mother valued education, and his father "went along with it." In high school, Shapiro had a strong interest in athletics, especially water polo. Without a clear academic interest, Shapiro's father suggested he major in economics, as it was closest to business. Shapiro decided to attend McGill University and became serious about his studies after taking a class in economic history, which he found fascinating, and after meeting his future wife, Vivian Shapiro, who was passionate about her studies and planned to study social work and child psychiatry. Shortly after graduating, his father became ill and passed away, leaving the two sons to manage the family's restaurant business for several years. They eventually sold it, which gave Shapiro the opportunity to attend graduate school. Shapiro applied to top American schools because of their reputation, choosing Princeton University based on the advice of a friend's uncle, Louis Rasminsky (1908-1998), who served as chairman of the Bank of Canada. Shapiro completed his PhD in three years under advisor Richard E. Quandt (1930-), building a model of the Canadian economy and the behavior of the Bank of Canada.

Upon graduation, Shapiro joined the faculty of the University of Michigan as an assistant professor of economics in 1964 after being convinced by Warren L. Smith (1914-1972) that the department would allow him to pursue his research interest and teach related graduate seminars. Shapiro recalls University of Michigan's significant computational facilities, which were critical to his research on econometric forecasting models, having learned to code on an IBM 650 as an undergraduate. During his time as a young professor, Shapiro led several projects sponsored by the Ford Foundation modeling the economies of Yugoslavia and Hungary and traveled regularly to Zagreb and Budapest during that time. After serving a three-year rotation as chair of the Department of Economics, he was asked by Michigan's president R. W. Fleming (1916-2010) to serve as university provost in 1977 and then as president in 1980.

Shapiro became interested in public policy during his time as president of the University of Michigan, spending time with Representative William D. Ford (1927-2004) and his staff discussing issues related to student financial aid programs and the federal investment in science and technology. Shapiro was recruited to serve as president of Princeton University by then-president William G. Bowen (1933-2016), despite his wife's lasting impressing that Princeton was too conservative of a town and their love for the city of Ann Arbor. Shapiro served as president of Princeton University for thirteen years, during which time he was appointed as vice chairman of President George H. W. Bush's President's Council of Advisors on Science and Technology (PCAST). Shapiro credits the success of PCAST—as well as that of the National Bioethics Advisory Commission under President Bill Clinton (1946-), for which he served as chair—to having the direct access to the president. He concludes with a discussion on the need for a critical look at the roles of universities, corporations, and government in funding scientific research and development in the context of rising investment from the private sector.

INTERVIEWERS

David J. Caruso earned a BA in the history of science, medicine, and technology from Johns Hopkins University in 2001 and a PhD in science and technology studies from Cornell University in 2008. Caruso is the director of the Center for Oral History at the Science History Institute, a former president of Oral History in the Mid-Atlantic Region (2012-2019), and served as co-editor for the Oral History Review from 2018-2023. In addition to overseeing all oral history research at the Science History Institute, he also holds several, in-depth oral history training workshops each year, consults on various oral history projects, and is adjunct faculty at the University of Pennsylvania, teaching courses on the history of military medicine and technology and on oral history.

Kenneth M. Evans is a scholar in science and technology policy at Rice University's Baker Institute for Public Policy. He received his B.S. in physics from the University of Virginia and his MS and PhD in applied physics from Rice University. His research focuses on the history and organization of the U.S. federal science advisory and policymaking system, with an emphasis on the role of the White House Office of Science and Technology Policy.

ABOUT THIS TRANSCRIPT

This interview was conducted as part of the project, "The President's Scientists" (NSF SMA SBE #1854055). The goal of the project is to improve and expand existing knowledge of the role of the President's Council of Advisors on Science and Technology (PCAST), and its impact on U.S. federal policy. This project examines the working nature and policy impact of the council by compiling and analyzing presidential archives and university collections of former presidential science advisors, including developing a digital archive of this material (https://whitehousescientists.rice.edu/); and conducting oral history interviews of former PCAST members to determine their perspectives on PCAST, as well as their personal histories before and after their tenure on the council.

The Center for Oral History, Science History Institute (the Center) and Rice University's Baker Institute for Public Policy (BIPP) are committed both to preserving the recording of each oral history interview in our collection and to enhancing research use of the interviews by preparing carefully edited transcripts of those recordings. The preparation of interview transcripts begins with the creation of a verbatim typescript of the recording and proceeds through review and editing by staff of the Center and BIPP; interviewees also review the typescript and can request additions, deletions, or that sections be sealed for specified periods of time. We have established guidelines to help us maintain fidelity to the language and meaning of each recorded interview while making minor editorial adjustments for clarity and readability. Wherever possible, we supply the full names of people, organizations, or geographical locations mentioned during the interview. We add footnotes to the transcript to provide full citations for any publications that are discussed, to point to extant oral history interviews, and to clear up misstatements or provide context for ambiguous references in the transcript. We use brackets to indicate the addition of material that was not in the audio, and bracketed ellipses to indicate the

deletion of recorded material. The transcript also includes time stamps at five-minute intervals. We omit without noting most instances of verbal crutches and all instances of nonlexical utterances. We also make small grammatical corrections where necessary to communicate interview participants' meaning. Finally, staff of the Center and BIPP create the abstract, chronology, and table of contents. With the availability of online full-text searching of our transcripts, the Center for Oral History opted to discontinue the practice of preparing a back-of-the-book index for each oral history transcript in 2020.

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

TABLE OF CONTENTS

INTERVIEWEE: **Harold T. Shapiro**

INTERVIEWERS: **David J. Caruso**
Kenneth M. Evans

LOCATION: **via Zoom**

DATE: **15 February 2021**

CARUSO: So I'm going to—like I said—I'm going to start at the very beginning. I know you're born in 1935, but I don't know where. I was assuming Canada.

SHAPIRO: I was born in Montréal, [Quebec], in 1935—exactly correct.

CARUSO: Okay, and can you tell me a little bit about your family? Do you have . . . ?

SHAPIRO: Well, I had [what many would consider an unusual family]. I [was born] in 1935, [right in the middle of the Great Depression]. I have to add, however, that my immediate [. . .] family was never seriously inconvenienced [economically] by the Depression as far as I could understand it. We [lived in an] upper middle-class neighborhood. My mother didn't work. [I was the elder of identical twins], and the only reason that may even be relevant is my [twin was Vice Chancellor of McGill University] when I was president here at Princeton [University]. [. . .] So that was kind of [an interesting factoid]. But in any case, we had a, kind of, normal, upper middle-class upbringing you might say. My father [who had immigrated to the US from Russia just prior to World War I as a metal worker, but for a good part of his adult life he "operated" on the wrong side of the law either through bootlegging or various gambling activities]. I [have always thought he immigrated from the US to Canada] just ahead of the FBI because [of his bootlegging activities. My father was never quite clear about this aspect of his history], but it's quite clear to me that he didn't just arrive in Canada because he suddenly decided liked colder weather or something like that. He came here because he was—I think—one step ahead of whoever was trying to impose the bootlegging restrictions of various kinds, and he came and settled in Montréal. [He] then continued to have various kinds of business—sometimes on the right side of the law, sometimes on the wrong side of the law. [In any case returning to my family history, he married my mother in the early 1930s.] He was twenty years older than my mother, so [in that sense] it was a little unusual marriage [for its day and by the late 1940s he eventually] settled down in the restaurant business [as I entered my teenage years. So] by the time I really got to know him, [the more "colorful" part of his life] was [mostly] behind him. [Nevertheless, his early experiences were well-known in the community, and it did color some of my early experiences and the attitude of some community members to this kind of family history.]

CARUSO: You mentioned your mother. Was she Canadian? Did they meet . . . ?

SHAPIRO: My mother was born in Canada; her parents had emigrated maybe a year or two before she was [born] so it's her parents [that] were immigrants [to Canada. As I have noted above], my father was an immigrant from Odessa, [Russia], and he got his first job—he [was] a tinsmith, a metal worker. He immigrated and moved to Toledo, Ohio where the automobile plants were, and he was . . . got his first job was actually in the automobile assembly line of the Willys-Overland Company, who eventually produced the Jeep—not at that time—this is back in the teens [of the twentieth century]. [. . .] He had been married in Odessa, had a wife and two children; the plan was to bring them here when he'd saved up some money. However, the World War I interrupted, and two of his three family members died either of starvation or the flu in 1918. He eventually brought his [surviving] daughter from that marriage to Canada [. . .] and so I have a half-sister who [eventually rejoined him] in Montréal. [. . .] But I really grew up [in an urban environment that was in many ways segregated along religious lines so while I lived in a metropolitan area I grew up mostly] inside a Jewish community. In those years in Montréal, the [principal] religious [communities were] really quite separate [residentially. Moreover, these faith differences were also mirrored in different residential areas]. So in [the] area of Montréal [where] I grew up **<T: 05 min>** there was no French-speaking people at all in the area. The [area was dominated by] English-speaking people, mainly Protestants and a sizable Jewish community, but [even] these communities were quite separate [in many ways]. [In] my early [years I took this segregation for granted]. I interacted with kids on the street regardless of who they were, but, you know, going to each other's homes was another thing all together. [As a young person] I don't think I was ever in [the home] of either a Protestant or Catholic member of the community. The Catholics were not very present in my area because they were mainly French-speaking, and [the Jewish community largely adopted English as a first language and located themselves] an English-speaking area in Montréal. I began my education in English-speaking public schools run by the Protestant School Board, but [. . .] in the fifth grade, my parents decided to enroll me in [an] all-male [English-speaking] private school. I went there as a day school student [and] I stayed there [until] I went to college. [I graduated high school in the spring of 1952 and entered McGill University in the fall of the same year.]

CARUSO: I was just going to ask. Do you have any recollections about life in Canada during the World War? Was there rationing going on . . . I'm just . . .

SHAPIRO: **[**Well, I was quite aware the war was going on, but I was still in grade school and] I was really mainly protected from [the realities of the carnage that World War II involved]. Of course, on the street, the kids were talking about it all the time; we'd have mock battles between this side and that side; various games were played. My mother was a warden; we had air-raid drills as if somehow the German bombers were going to be over Montréal and everyone had to turn the lights off and the warden would walk around the street, making sure all the lights were

out in the various houses and so on. [In my childhood reality] I saw soldiers on the street [and on parade, but I had only two relatives in the military, Abraham Fleming and Sid Tafler], one of whom [Sid Tafler] died in Europe [on a bombing run]. But for the most part the war had little impact on my life; I can remember in first grade we were all supposed to draw pictures and put them up on the wall in the hallway for parents to come and see; almost all of them were war pictures—you know, battleships or airplanes and stuff. But in reality, there was [. . .] pretty strict rationing with certain kinds of things—rationing of gasoline, rationing of sugar, rationing of butter, rationing of meat, and so on. However, as an economist would know, there are [formal and informal black markets] so my mother had an arrangement with her butcher; she gave him all the meat coupons, and he gave her whatever she wanted. I think she didn't ask too much [about] what the price was, so [. . .] I was privileged in that way: I didn't really experience [any privation with the exception that when I finally graduated into an adult-sized bike I could not get chrome handlebars! Moreover, my parents refused to let me get a new bike until I was in college. Clearly, I did not experience any real deprivation at all during the War].

CARUSO: And just out of curiosity, did you . . . do you remember hearing about America's use of the atomic bomb on Japan?

SHAPIRO: Well, yes at that time, I certainly heard about it, but, in my experience, [its implications were overwhelmed by general excitement surrounding VE Day and VJ Day]. For my parents, that was the overwhelming [development and the atomic bomb and its meaning for the future of humankind escaped our family's attention]. As you can guess, a very large part of [my] parents' families perished during the war [as a consequence of the Holocaust and the relief brought about by the war's end, the possibility that some relatives survived, dominated their emotions]. The A-bomb was something. First of all, my parents didn't understand; they didn't know what it was in the sense that we would think about it today, and I don't even recall a single conversation [about it. In their minds] [Franklin D.] Roosevelt and [Harry S.] Truman were heroes and so was [Winston] Churchill and all the other people that were on the Allied side—and that was what dominated the conversation. I don't think I thought about the A-bomb carefully [until] I was [about to enter college in 1952].

CARUSO: So, being in a Jewish community, being Jewish yourself, were there discussions about the Holocaust?

SHAPIRO: Well, this varied a lot household to household. [Sadly, in our household, it was not a matter of serious conversation. Fortunately, I picked up a lot from conversations with my friends and to some extent from newspapers]. I picked it up mainly from friends where this was an everyday conversation in their houses. [. . .] I don't know just what my parents had in mind in this respect—whether they were trying to shield [my brother and myself] from all that kind of [reality] and I think that [may have been their motivation, but I] really don't know; I never really pursued it with them.

CARUSO: You mentioned your twin brother. Is he identical or fraternal?

SHAPIRO: An identical twin.

CARUSO: Identical twin. And did your parents have any other kids after you?

SHAPIRO: No, I had his half-sister, which my father had from his first marriage, but she really was more like an aunt; she was really my mother's age. So while she was my [half-sister], I thought of her as an aunt and treated her that way. We were really in different generations.

CARUSO: So what were some of the things that you and I'm assuming you did a lot with your brother when you were younger . . . what were some of the things that you and your brother did when you weren't in school? Let's go to about fifth grade or so.

SHAPIRO: In fact, we were not alike at all in that way; we did [not] do things together [although we lived in a shared a room until we married and left home. So we lived at home and shared a room throughout our college experience we] had [very] different interests. When we were growing up, I had a great interest in [. . .] athletics; I played on my high school football team and basketball team. I was on the swim team; I was always engaged very heavily in athletics. My brother hated athletics; he didn't like watching it, and he didn't like participating. And it's the same today; I mean we're now in our mid-eighties. He's still the same way [in this respect]. I never call him and ask, "Did you see the baseball game?" He never watches a baseball game or a tennis match or something, so in fact although, as I said a moment ago, we shared a room, we didn't really share a life. I mean, in those days, everybody—families—ate together in the evening usually, so we did that every night, so we were together and of course we were sleeping in the same room. But we had different friends, different interests; my brother stayed at home much more than I did, and so we really were very different and our [mutual] friends in Montréal, who [we] are still friends with today, just can't get over [the fact] that we ended up somehow being very similar, doing very similar things because in those days they always distinguished us between the kinds of things I did and the kinds of things that my brother did. So obviously, we got more alike as life moved on, but in those days, we were not together at all [outside the house]. I mean hardly at all.

CARUSO: But you were both sent to the same private school—the day school?

SHAPIRO: We went to the same private school; we were usually in different classrooms. It was a small school, so sometimes there weren't enough students to have two separate classrooms. But sometimes if there were two classes of the same grade, we were in separate classrooms. You know, it was a **<T: 15 min>** school, which was imagining itself as maybe being one day the Eton of Canada. Of course, it never even closely got to that level, but they had very many British customs they followed; [for example], there was a cricket team [always looking for opponents, which were difficult to find]. The [school also adopted the British schoolboy custom by calling you by your last name. This created a clear problem when my brother and I were in the same class and of course we had the same last name. They solved this problem by calling us Shapiro 1 and Shapiro 2 or Shapiro A and Shapiro B, etc.].

CARUSO: You also mentioned that your family started . . . your father started the restaurant business. Was it just one restaurant, or was it a chain?

SHAPIRO: Well, it started off as one restaurant in 1945, '46—I'm not sure exactly what the year is—'45, [or] '46. Eventually, when this blossomed out a bit, they had one major restaurant and they had other restaurants. [One of the smaller restaurants my father and his partners had was right out of the 1950s—"a Drive-In"]. It was [a "drive-in" restaurant] where you drove up, and they brought a tray outside and served [you in the car. But this was a smaller operation than the principal restaurant they operated].

CARUSO: Was there a specific type of cuisine?

SHAPIRO: Well, [the restaurant offered two different cuisines prepared in two different kitchens by two different groups of chefs]. It had a kitchen that prepared Chinese food and a kitchen that prepared . . . . I don't whether you call it American food or not—[but it featured] steaks, lobster, roast beef, [shrimp, fresh fish], etc. [. . .] At lunchtime, [we featured a special from our American kitchen. It was an expensive restaurant for its day and quite successful financially. The restaurant opened just after World War II. It was an auspicious time since people had a lot of money, began driving cars etc., and since we were outside of downtown with a big parking lot it became financially a very successful venture]. The seating in the restaurant was upwards of seven hundred, so it was a very big restaurant. And in its day, it was very successful from a financial point of view.

CARUSO: I know friends—colleagues—who grew up with parents in the restaurant industry and they also essentially lived at the restaurant at least in the early years before places got off the ground. Were you spending much time at the restaurant, or was it that your father went there, he came home?

SHAPIRO: [My brother and I did not] spend any time there until we got to our late years in high school [when] we used to work there during the summer doing . . . at first [we did various menial jobs] and then when we were in college, we began [to have somewhat more "advanced" responsibilities, but only in the summer since our mother wanted no interference with our school work]. She was always worried we wouldn't study hard enough, so we weren't allowed to work or more or less do anything [beyond our schoolwork] during the time when school was in session.

CARUSO: So education was extremely important to your family?

SHAPIRO: Education was very important to my mother and my father went along with it. [In a nutshell] he thought he did very well without [any formal education beyond a few years of elementary school]. [My father] was orphaned when he was, I think, seven or eight years old and came from extremely poor background and, as I mentioned, he eventually became a metal worker. But for my mother, it was important, but she really didn't know much about education. She had left high school when she was about [in the tenth grade well before graduation from high school] because she had to go to work to [help] support her parents and sisters and brothers. She's one of six. But my mother—for whatever reason—education was very important to her. Indeed, it'll sound very funny—if not very odd—my **<T: 20 min>** mother wouldn't get a television set in our house till I graduated from college feeling that I might get hooked on television and not spend enough time working [on my studies]. She knew that [education] was important [even though she had no idea] what a university was. [She] knew you had to go to university, be a doctor or lawyer or something like that, [but neither she nor my father had any notion of how a university operated and what it offered]. When my brother and I graduated from high school, we were offered scholarships to various universities in the US—two or three universities; my parents thought this was the oddest possible thing—there was a perfectly good university a bus ride away and that's where we were going and I didn't know much better myself at the [time. And] so I and all my friends [did the same thing] . . . we all went to McGill University, and that was just the way [it was]; it seemed very natural at the time.

CARUSO: Okay. You'd mentioned your interest in sports and athletics. Were there any subjects in school . . . well, actually, let me . . . before I ask about school. Did you have any other hobbies as a kid or a teenager? Were you playing with chemistry sets? Were you looking for gold in the backyard? Did you go out and do birdwatching? Did you have any other sorts of hobbies while you were growing up?

SHAPIRO: [Beyond using a chemistry set, which was easily available in those long ago days to set off an explosion in a neighbor's driveway, I led a rather uneventful childhood years. For a number of years, I took competitive swimming and water polo seriously, but I left that behind as I entered university.] Looking back, I must have been one of the most [frivolous] seventeen-year-olds that ever arrived [on McGill's doorsteps. I did not have any real] notion of what I was

going to do, [or how I would construct an independent adult life]. I did [not] have any special interests in science—let's just say—or any other subjects! [. . .] I went to school, did my work, did well at school, but I didn't really have any [special interest or goal]. As I mentioned earlier before, to the extent I had spare time . . . so when I was older like when I was fifteen, sixteen, seventeen, I spent an hour or two a day in the pool either playing water polo or training, and I was a mediocre water polo player and a mediocre swimmer, but [. . .] I enjoyed it. But the truth is I [. . .] had no idea what I was [going to become] when I entered university—no idea. I did [not] know what was going to be expected of me, I did [not] know where it was [all] leading. My father suggested to me that I take economics; I think he thought that was somewhat close to business, [and I followed his advice].

But my interest really in what we might consider the broader world even in a very simple way really began [. . .] when I entered McGill [University] and started taking my first courses and realized that [there was a fascinating world of understanding around me and that I even might be able to effectively interact or even impact events. Moreover, in my freshman year I met a young girl of fifteen who eventually became my wife who had an enormous impact on how I might do something and should do something to impact the world around me even in a small way]. The very first time we went out together, she asked me what I was going to do [with my life]. Of course, [at that stage] I hadn't the slightest idea. [Perhaps I never] ever thought about the question [until that moment. Her response was]: "Well, you know, you should know what you're going to do, and I know what I'm going to do," she says. She announced as a fifteen-year-old [that she was going to do something to help families function more effectively and she actually constructed her education to fulfill this objective]. The truth is that it was really under her influence more than anyone else that got me to be serious about what I was doing and to take myself seriously and to take my work seriously. [In short I changed a lot in my university years. I will share an amusing anecdote that involves both being a twin and my academic revival! Academically I did well in my freshman and sophomore years. Indeed I did well enough to be given a scholarship for the ensuing years at McGill. As a result, I received a letter in the mail sometime during the summer from McGill University informing me of this award. **<T: 25 min>** So I was very excited since unlike my twin until that point I had a mediocre academic record]. When I told my mother [about my scholarship], her reaction was, "They must have meant your brother." [. . .] [laughter] And she was right. I mean, that [her response was not irrational, and I was] a little deflated at the time. When I thought about it carefully, [she fully expected that my twin brother would be in the scholarship category, but I was not that kind of material! This amusing anecdote reflects the] big change in my [academic] life [that] took place when I was in freshman, sophomore years.

CARUSO: So I do want to hear about the changes, the courses that you were taking, but before I go on, I just I need to know: so what is it that your wife had—before she was your wife—what is it that she wanted to do?

SHAPIRO: Her [aspiration] was to become a social worker and help families because she wanted to help young children and families and, in fact, even after [her PhD and throughout her

scholarly work and publications] she focused on helping young—young meaning less than five years old and sometimes less than two years old—helping families dealing with children. She worked [in this area] her whole life, did a lot of research [in this area, and it is evident in her publications]. So she [continued work in this area throughout her career].

CARUSO: Thank you for that. Now you mentioned that, you know, entering McGill, this was . . . it was an important transition for you. I know that you graduated with a degree in communications?

SHAPIRO: No, in commerce.

CARUSO: Oh, commerce, okay.

SHAPIRO: It was a business degree essentially, but McGill called it commerce at that time; I do [not] know if [this is still the case].

CARUSO: Okay, so what . . . you mentioned your father recommended taking economics. What other classes were you taking when you . . . ?

SHAPIRO: Well, he had a very particular recommendation; he thought [that perhaps] I ought to [. . .] become an accountant, so I took a lot of courses in my first three years especially in accounting because [my family thought this would be a good profession even though it then involved a long apprenticeship] in an accountant's office. [A number of things happened to change this trajectory. First in my freshman year at university I took was a course in economic history. It was a broad course in economic history running through the entire first year whose content began in ancient Egypt and ended after World War II that spanned economic history and was given] at that time by the [Vice Chancellor] of the university [F. Cyril James]. [It was an introductory survey course with three hundred to four hundred students. I found the course] absolutely fascinating. I had never thought about history in that way [and it then dawned on me that I arrived at McGill with a very narrow view] of what the possibilities were to express one's humanity. [Many freshmen have had this experience, and I decided to search for the broadest curriculum that satisfied the university's requirements]. Then by the time I got to be a junior, my [future] wife was a freshman, and she was taking a whole different [set of courses anchored in history and literature. Then I began "sitting in" on her courses as well as my own. I realize I had mixed motives for doing this, but I would observe that] she never attended any of mine. [In any case, by the time I was a senior it was clear to me that] I was not going to be an accountant. [Shortly after graduation from McGill my father became ill and passed away, and my brother and I found ourselves in the restaurant business with my father's partners. Further decisions on my career would have to wait]. <**T: 30 min**> That's why—in my case—I had a, kind of, four- to

five-year interval where my brother and I were [helping to run a very successful and large restaurant which was eventually sold and both of us set off for graduate school].

CARUSO: So just to ask . . . prior to your father's health declining, did you have a vision for what it is you wanted to be as your next step from college like . . .

SHAPIRO: No.

CARUSO: No? So . . .

SHAPIRO: **[**At that time] I knew I wanted to do something else [outside of the business world, but I had not yet focused in on an academic career or even an academic discipline. However, I had taken a lot of economics as an undergraduate, and an academic career seemed increasingly attractive. However, I had not ever met a professor outside of the classroom], nobody in my family knew anybody who was a professor, [and I think they were dubious of the whole enterprise especially because I was already married and had two children and my wife had just graduated and was anxious to begin her social work education]. So I had in thinking about going to school [I was very conscious that I had a family to take care of. Fortunately, I had some funds from the sale of our business and a small inheritance from my father that made the decision to enter graduate school possible].

[The decision to pursue graduate work in economics was in many ways the path of least resistance. I had taken quite a few economics courses as an undergraduate and enjoyed the discipline and it seemed natural at that moment to continue down this path]. Sad to say, it wasn't any deeper feeling or understanding than that; it was just a very practical thing to do. I didn't know much about university life, [but economics seemed] to give me a start. I was good at mathematics—or at least I had been good at mathematics when I was in college. [. . .] Sad to say this is a very haphazard way to get anywhere, but that's the reality—it was a very haphazard—I wouldn't say casual because that would mean I didn't care—I did care, and I cared about where I went. And [. . .] I can tell you an amusing story about that if it doesn't take up too much of your time. [Initially I did not know where to go to graduate school and I was uncertain where my qualifications would allow me to go. Of course, I knew of the reputation of places like] Harvard [University], Yale [University], Princeton [University], [University of] Chicago—places everybody has heard about, so I thought, "Oh okay. I could start there." I didn't know whether I would qualify for admission or anything, so I applied to Harvard, Yale, Princeton, Chicago not having the slightest idea which one I should go to, and it turned out I was admitted to all four of them. We should remember that this was in the early 1960s when competition for places in graduate schools was not so difficult as it is now. However, I did not know which of these distinguished places to go to. Fortunately, I had a friend] whose uncle was chairman of the Bank of Canada, which is [analogous to the] Federal Reserve [Board in the United States, and I consulted my friend]. He [quickly suggested that I speak to his uncle Louis Rasminsky, and he

set up an appointment. His advice was very succinct, and I quote], "Well, Jacob Viner is at Princeton, so I suggest you go there." I said okay, and that's where I went.

I arrive at Princeton, [and the first thing I wanted to do] was go see Professor Viner. I find out where his office is, **<T: 35 min>** I go to the office, the office is empty, and there's piles of books outside his office lined [up and] down the hallway. So I go to the secretary's office [and inquire]: "Where's Professor Viner?" "Oh, he just retired." And I said, "Well, who's going to replace him?" She said, "You have to ask [your advisor, Professor Richard E. Quandt. He quickly informed me that Professor Viner would not be replaced because the department had other priorities. I thought I was going to study the history of economic thought, which was now not quite possible] so I was assigned [Professor Quandt] as an advisor. Professor Quandt [. . .] looks over my [academic] transcript from undergraduate work and says, "Well," he said. "Our graduate program has no [formal course requirements] so after you take some courses and when you're ready, you show up for your general examination." He said, "Looking your transcript here, you've taken [a lot of economics courses], but you haven't taken enough mathematics. My suggestion is you go take some courses in mathematics and take whatever courses in math you like, but the mathematics is [becoming increasingly important in economics]." So I [followed his advice and] I spent most of the next two years in the mathematics department taking essentially junior and senior courses in mathematics, occasional graduate seminar [in game theory], and then I presented myself for the exams, passed the exams, and I was done—I had my thesis [left] to do—but I was done [with coursework. So this whole thing all in retrospect seems very [informal or haphazard but we were all encouraged to attend seminars and begin writing papers. Nevertheless, by this time], I knew what I wanted to do; I knew I was heading somewhere [despite this odd background].

CARUSO: Yeah, so some follow-up questions if you don't mind. Oh, so one thing I tend to ask individuals about—you didn't mention it so may be of no significance—did you have an awareness of or response to the launch of Sputnik in the late fifties?

SHAPIRO: [Not really, beyond the general excitement around the event. At the time I was living in Canada and did not connect it to geopolitical issues]. It did not excite my imagination in the sense that I suddenly wanted to become a scientist.

CARUSO: It's just—again—I've interviewed a lot of US scientists, not as many from Canada and even, you know, just talking about the American context, it's this Communist threat, right? I'm curious to get other perspectives on that same event. You also mentioned that you had two kids—right?—and your wife had finished her degree, so this is before going to Princeton—right?—two kids and . . .

SHAPIRO: [More generally] Canadians were a lot less invested in the Soviet-US [nexus of the Cold War and the competition between the US and the Soviet Union. Canadians thought of

themselves and their society as much closer to the US than the Soviet Union or even the so-called non-aligned countries]. Canada—as you know—is not [major geopolitical power].

CARUSO: Yeah, I guess part of my curiosity is with Canada being adjacent to a country that seemed like it might be starting or potentially starting a nuclear war, you know, with those types of weapons you don't even really be near . . .

SHAPIRO: Anywhere. You don't want to be anywhere [in such a circumstance. Nuclear war is so scary that the only way to get along in life is to stash this potential disaster somewhere in one's subconscious. Perhaps I was just naïve with respect to these major geopolitical issues at the time]. **<T: 40 min>** I didn't really relate to [these matters] in any [. . .] really emotional way, which is a very sad comment actually, but there it is.

CARUSO: Well, you were also, you know, trying to run a family business, you had a young family, there was a lot going on in your life.

SHAPIRO: Oh yeah.

CARUSO: But the bigger things if they weren't directly relevant to you . . . you note them, but you don't necessarily fixate on them if you have other things happening.

SHAPIRO: I just wanted to point out that my wife's graduate education, sort of, developed over time. We had this very young family; we were moving to Princeton. So she slowly accumulated what was necessary to get her advanced degrees, but [since she had so many responsibilities in family matters, her graduate work progressed slowly but surely]. It only took me [only three] years to get my PhD and it took her quite a bit longer. [. . .]

CARUSO: Yeah, so that's what I was actually going to ask was knowing that she did pursue her degree I wasn't sure if she was applying to graduate programs, or she had planned to take classes at whatever location the two of you went.

SHAPIRO: **[**Sadly, you are right. My career took precedence over almost everything in those early years. Arrangements would be very different and better today. As a result, Vivian had a lot of challenges to overcome to establish her professional career].

CARUSO: And were there any concerns for you or for your wife in terms of moving to the United States? You mentioned . . . . I mean, it sounded like you grew up in Montréal; I don't know if your family traveled.

SHAPIRO: **[**Yes, my family did travel quite a lot in my teenage years]. I was the first one of my friends to go to travel to Europe [twice], travel to California, [to South America, to Israel] so I was very fortunate in that respect. [. . .] That was unusual at the time, [but much more common today. Times] were different.

CARUSO: When you arrived at Princeton, how many other individuals were in your entering class in the department?

SHAPIRO: It was very small. I think—I can't remember [exactly]—it was like ten [or twelve], let's say. Very small.

CARUSO: Was it predominantly men? Any women in the economics . . .

SHAPIRO: It was all men. Princeton's coeducation started in their graduate programs, but that started just after [my time there. As I now recall it began in a very small way in 1963-1964, which was my last year as a student at Princeton]. There [were], I think, one or two women graduate students around out of a pretty large numbers overall, but it was a completely male environment in every bad way you can think about it at that time. My wife did not at all like it at Princeton—[the town or the university]. She thought [the whole scene] was much too conservative: the [students] were too conservative, the [. . .] town was too conservative, and she was right. So she felt like it was a breath of fresh air when we moved to Michigan. She just felt it was a whole different environment. She was very glad to [leave for Ann Arbor, Michigan]. She was reluctant to [return a few decades later for exactly these] kinds of reasons.

CARUSO: For those early experiences. When you entered Princeton, you had the Harold Helm Fellow. Was that an automatic thing for anyone entering Princeton?

SHAPIRO: [At least in my understanding], it wasn't automatic. **<T: 45 min>** [. . .] I had [been awarded] fellowships every year I was at Princeton, but I always gave the money back because I had money left over from selling the restaurant and I felt that I shouldn't take that money that other students could use it who didn't have money to go to graduate school. So I won fellowships every year, but I never took any of the money. I don't know if anyone ever does that anymore or if anyone [else] did it then. [. . .] I was in that fortunate position, and of course tuitions, as you all know, were [much lower] than they are today.

CARUSO: So, how was it managing time as a graduate student with also having a young family?

SHAPIRO: Very difficult. I worked—I have to say I'm a hard worker anyways—but I worked very hard those [days since finishing] in three years wasn't easy, but I was very motivated because I had a family and I had to get settled and I couldn't be around graduate school indefinitely. And so I was extremely motivated to finish quickly. Princeton, as I mentioned before, had no specific requirements other than [passing] the general examinations [and writing a PhD thesis], so I just moved as quickly as I could, and I think I wrote my thesis in nine months—something like that. So I was lucky I picked a topic that worked; I mean you can [easily pick] a topic that doesn't work. [. . .] So I was very glad to [leave Princeton with my degree and establish a career elsewhere. I really enjoyed my professional life and colleagues at Princeton], but I was glad to finish and get on to having some kind of regular job. [I recall you inquired] why am I in the US instead of Canada. [In fact, when Vivian and I came to Princeton], we had no intention of coming to the US; our idea was we're going to go back to Montréal where our family was, or maybe we [would] go to Toronto, [Ontario], maybe we [would] go to Ottawa, [Ontario]. In those days, universities everywhere were growing; it was [relatively] easy to get jobs—very, very different than today—so every one of my colleagues in my class at Princeton could choose at least between two or three different jobs, which they thought were useful to them.

I had [no intention of staying in the US]. I had interviewed at the Bank of Canada, I had interviewed at the University of Toronto, interviewed at McGill University—all of whom had jobs and all of whom offered me a job. [However], I was walking across the Princeton campus one day, and my thesis advisor stops me and says, "Professor [Warren L.] Smith [. . .] from the University of Michigan is here interviewing [new graduates and he] would you like to interview [you]. He's here from the University of Michigan." I said, "No, I'm not going to Michigan; I'm going back to Canada." He said, "Well, the problem is that I told him you would interview." [laughter] So I said, "Well, okay, [. . .] I'll be glad to go to the interview, but I'm going to be honest. If he asks me the question, I'm going to tell him what I feel." And corny as it sounds, this [Michigan professor] seduced me into coming to the University of Michigan [by offering me special opportunities to pursue my work that I had started when writing my thesis. My prospective colleagues in Canada were less interested in my work focused on econometric model building indicated that I needed to fulfill certain departmental requirements in the teaching program and after some time return to my research work. This was not] an unreasonable attitude. [On the other hand], Professor Smith from the University of Michigan said—asked me what I was working on—he says, "We need people working in that area." He says, "Come to Michigan. You can work in that area; we'll figure out who's going to teach [introductory economics] and so on later on, but right now [if] you want to work in that area, this is what we want [also. We're] looking for [someone in your area]." So [even though neither my wife or I knew much about the University of Michigan or Ann Arbor I convinced her that the possibility of establishing a research program was worth going to Michigan at least for a

short time]. If we don't like it [there], we can go to Canada then. In the meantime, I can get my work started." And that's how we went to the University of Michigan; we had no idea even we went that we were going to stay [for a long time, but we loved Ann Arbor from the first day]. But it turned out when we went there, we . . . obviously it turned out we **<T: 50 min>** liked it. I mean, we liked Ann Arbor very much—thought it was a great town [with great people]. We liked living there, and so one thing led to another—[we] never did go back to Montréal.

CARUSO: Since I'm unfamiliar with you know the . . . especially the area of economics that you were interested in . . . when you use . . . when you talk about large modeling, were you running calculations with that model? Is this something . . . so . . . ?

SHAPIRO: They were forecasting models.

CARUSO: Okay, so what I wanted to ask was were you then also using early computational systems—computers—in order to . . . like punch card systems and . . .

SHAPIRO: Oh well. I'll tell you . . . I'm sorry to talk so much.

CARUSO: No, no. I love it when you talk.

SHAPIRO: **[**Yes, the work was very dependent on access to computation. Moreover, even in my undergraduate years I stumbled into the world of computers. My guess is you] probably don't know anybody that every programmed an IBM 650—you're much too young to have known anybody—your [parents] probably didn't know anyone who ever did this. [It happened as follows. In the spring of] 1954 so I'm between [. . .] my sophomore and junior year—and I [noticed] a sign on the notice board: "computer programmer wanted—ten dollars an hour—summer." [. . .] I had no idea what a computer programmer was—I didn't know what a computer was—but I saw ten dollars an hour, and I said, "Well, I'm going to investigate it." [The notice indicated that anyone interested—there turned out to be a few others—to take an examination]. The examination was on differential equations. I had just taken a course in differential equations weeks ago. Not only that, the examination they gave us was the exact same examination I had [received] in my differential equations course—exactly. [laughter] The professor hadn't bother to make up another examination, so of course [. . .] by that time, I knew the answers to all the questions because the ones I didn't get on the exam, [. . .] I had, [with some help], figured [out] later on. So I sat down there, and I couldn't believe what I was looking at, but I did the exam. When I finished, I was embarrassed to say I'd finished because everyone else was working hard on [dealing with the questions]. I was almost embarrassed to get up and hand the paper in, [. . .] so I spent as much time as I could pretending to go back and review my questions and so on, and eventually I handed the exam in.

And not surprisingly for completely irrelevant reasons, I got the job. I went down on the first day on the job and I walk in his big room and the IBM 650 took up [the entire room even though it probably had less power than your iPhone]. They [gave] me a pile of manuals and say, "Okay, start reading. You're going to be our chief operator during the daytime this summer." So I had to teach myself programming. From the start, I didn't even know what programming was, and in those days, you didn't have any of these [powerful] languages that you have now. [Initially, we] had to program [in] machine language so [. . .] it was very, very primitive [by today's standards], and we didn't even [have] Fortran, which [itself] is now considered a very old-fashioned language. I had to just teach myself, and I spent the entire summer—most of it—as learning how to [operate the machine and complete certain computations that were assigned to me. I] had to start the machine in the morning; [and] it was like starting an aircraft. [. . .] You had to go down a list like they say [contemporary] pilots do. [If we missed a step, we had to start again assuming we had not blown a fuse in the interim. Somehow I got through the summer]. I learned [a little] programming, and [in the fullness of time I always regretted I did not take fuller advantage of this initial opportunity. Of course, I had no real insight about what was about to happen in the world of computation. Over the years I have inquired among my colleagues here at Princeton if anyone ever had programmed an IBM 650. At best they could recall seeing an IBM 650 in a museum]! **<T: 55 min>**

CARUSO: So then in graduate school when you were doing your modeling thesis, did you have . . . were you running modeling through a computer? Did you have . . . ?

SHAPIRO: **[**Yes, but by that time] Fortran was a pretty well-established language—nowhere near as powerful as what my students use today—but Fortran was [from my perspective a big step forward. Very shortly after joining the faculty at the] University of Michigan [and joined an econometric forecasting group where we were still inverting matrices by hand, and we were just addressing our need to write a program to invert matrices]. I think most [researchers today would consider this a rather primitive operation for which they would assign to high-level programs designed for this and other "primitive" calculations. Today] inverting matrices by hand [would seem rather odd].

CARUSO: So did Michigan have . . . so I mean I know the history of computing to a certain degree—Harvard, Princeton—I know the universities that had some of the major computers and were innovative in those developments. Did Michigan have . . . ?

SHAPIRO: Yes, they did have [good facilities for that time and had fully developed] their own programming languages. They had [relatively] advanced computing. They had much better computing than Princeton had when I [was a student and the facilities were much more] accessible. We still had cards and tape and all that stuff which were everywhere those days, [but Michigan] certainly [had] better [computing] facilities than Princeton had at that time; I can't

speak about Harvard—I don't know. But [Michigan] had very good facilities; they had their own programming system. I forgot what they called it; they had a name for it. Eventually, of course, people stopped developing their own languages, and [we all migrated to particular standardized systems. In summary, my work was very dependent on advanced computation facilities, but I relied on others to put these needs in place].

CARUSO: So any of the institutions that you were considering in Canada, did they have large computational systems there as well?

SHAPIRO: **[**Not all of them. When] I was interviewing [for a position] at the Bank of Canada, the interviewer said, "Well, are you good at mathematics?" So I very proudly [told him about the series of mathematics course I had taken. After a pause, he looked at me and said], "I mean, can you add?" [laughter] To give you an idea where the Bank of Canada was in [relation to computation facilities in those long-ago days]—they had nothing. We had to use computers at the University of Montréal; we shipped programs back and forth at night by bus—the input goes in by bus, [the output] comes back, [if we were lucky] the next morning by bus. [. . .]

CARUSO: Okay. Yeah, I was just curious. I mean you mentioned that Professor Smith talked you into going to the University of Michigan. I was just curious to know whether or not . . . a university can have an interest in an area but not necessarily the support for that interest.

SHAPIRO: **[**Certainly, that is often true. At that time, I mainly wanted to go somewhere where I could pursue some of the interests that I had developed in applied econometrics and that requires computational facilities. Moreover, I wanted to teach in associated areas]. In those years, there was [interest in my area, but] nothing like the [computational] support that anybody gets today at a distinguished university whether it's Rice [University] or Penn [University of Pennsylvania] and [many other] places. The level of support at the University of Michigan at that time was minimal in terms of finances to [support research groups], but I was fortunate enough to be able to get support from the National Science Foundation [NSF] for a long time, [perhaps even longer than we deserved since we] were no longer doing things as innovative as we were doing in the early years. [. . .] We were supported principally by the National Science Foundation over the years, sometimes the Ford Foundation. I [led a particular project financed by the Ford Foundation] that lasted five or six years [focused on joint work] **<T: 60 min>** with the Central Statistical Office both in Zagreb in Yugoslavia and Budapest in Hungary. Those were in the "bad old days" when, [Hungary was behind the Iron Curtain and Yugoslavia had its own dictatorship]. Hungary [in particular] was still part of the Eastern European Bloc [largely] controlled by the Soviet Union. [I was told by the Ford Foundation that the underlying objectives were to assist these agencies in monitoring their five-year plans. I understood I would work with colleagues in their Central Statistical Agencies to enhance their economic modeling capacities. In particular, they wanted to get a better idea in real time of just how their plans were

progressing. In practice what we were able to focus on was developing econometric forecasting models].

[As I recall], I got approached by the Ford Foundation [through colleagues of mine at Michigan] to see if I [would] be interested in spending time in Yugoslavia and Hungary to help them get their modeling [capacity improved. While this was a part-time assignment, I spent quite a bit of time in Yugoslavia in Zagreb and Budapest]. And when I first [arrived in the Central Statistical Office in Budapest I was greeted by my Hungarian counterpart who quickly informed me that it would be necessary to meet with the Director of the Central Statistical Office before we get started. I presumed that this was a formality although I was quickly informed that he was also a member of the Central Committee of the Hungarian Communist Party. After greeting me, he inquires—not quite directly—if the "CIA" has sent me here]. I said no and [that my project was being financed by the Ford Foundation. I guess he found this explanation acceptable since the meeting ended politely but quickly, and he wished me well in working with his colleagues. And over the next four years or so [I never another word about [this matter. In] later years, [there were rumors that the] CIA [Central Intelligence Agency] sometimes funnels money through these foundations, [but] I have no idea if this was the case here; I haven't the slightest idea. I have no knowledge of any kind, but I've always wondered about it since then because of course we were accumulating data and about not only the Hungarian [and] Yugoslav [economies, but also] the Soviet economy [and the Czechoslovakian economy] because we were comparing their models with the models we [and others were using so we had access to a lot of data on these economies].

[As these projects reached their final phases, I suggested to my Hungarian colleague that we write some articles together on our experiences in building these models together with an assessment of our successes and failures. I was then informed that once we write these papers they would have to be reviewed by an internal group before submitting them to appropriate journals. I indicated to him that I was not used to such a procedure, and I preferred to submit them directly to selected academic journals. After some discussion, he finally said to me, "To you it is a matter of principle; to me it is a matter of my job." As I understood their review process it involved sending it to a committee associated with the Academy of Social Sciences in Moscow and their initial response was that the article was too critical of the work we had reviewed and evaluated and by implication, they would not approve it for publication. After some further discussion among ourselves we made some modification of our paper and] <**T: 65 min**> we sent it back to the Soviet Academy of Sciences. [After returning to Ann Arbor I received] a six-page, single-spaced letter in Russian, [which I had to ask colleagues at Michigan to translate, indicating that while they were satisfied with the new draft, we had not been critical enough of the material we had reviewed as we did our work. They indicated that they were ready to approve submission of our new draft, they opined that the paper was not critical enough and progress could only be attained through thoughtful criticism! I then suggested to my colleague in Budapest that we restore some on the material we had deleted, but after some hesitation he suggested that I misunderstood the message, and we should stick with the revised version]. And that's what we did. It eventually got published here in the US.

CARUSO: It took some time to get through.

SHAPIRO: Their process took some time, [and] it was exasperating at the time. [On reflection I think I was not always sensitive to the constraints my colleagues were living with].

CARUSO: So, can you tell me a little bit more what it was like starting up at the University of Michigan. You mentioned Professor Smith was like come here, do your work, we'll figure out courses later. Were you . . . when you went there, were you . . . ?

SHAPIRO: Well, [of course] I had to teach [just as all my colleagues did], but I could teach in [areas] that really concerned me and [that were related to my quantitative research interests]. As you could guess, teaching loads those years [mid-1960s] were a little heavier than they are today in most places like Michigan or Princeton, so we had to teach two courses every semester. And I had to do that, but I could do it in the area that I was working in; that was the big difference and [reflected their willingness to support my research]. So as far as I'm concerned, the University of Michigan did exactly what they said they were going to do, and I really liked it there. We were very surprised at the end of the day that we ever moved from Ann Arbor; we loved the town, we liked the university, had good friends there, and so on.

CARUSO: So when you were at the university, I know that you progressed up the ranks—right?—you started as an assistant professor, you became associate professor in '67.

SHAPIRO: I had three years to associate then three years to full professor. Then [director of] the graduate program.

CARUSO: Right. So when you were teaching, were you teaching both undergraduates and graduates?

SHAPIRO: Yes.

CARUSO: And did you have graduate students working with you on your research, or did they . . . ?

SHAPIRO: They worked with me on their theses for the most part; we had a group of research assistants in what we [called] the Research Seminar in Quantitative Economics [RSQE], which by that time was run by one of my colleagues, Saul Hymans, and myself. And these are graduate

students coming through; they were research assistants for us, and they generally picked thesis topics somehow related to the work that they were doing. [. . .] [For example], we were building these big models of the US economy, they may have been working on the [details of the housing sector] for [their] thesis purposes worked [very] well. [In the longer term, their work improved our model].

CARUSO: Okay. In 1976 you became . . . you have the title research scientist in the Institute of Labor and Industrial Relations and research scientist in the Institute of Public Policy Studies. What . . . ?

SHAPIRO: **[**This was for a period when I was working with Malcolm S. Cohen on a series of projects dealing with employment in the State of Michigan. It was Malcolm that generated the support of the State Government for these studies]. **<T: 70 min>** It was [a situation] where someone else had generated some grant funding money and needed help in some areas, and that's [where I came in and joined] that project.

CARUSO: Okay, and so that's why—in looking at your CV—you're listed as being a professor of economics and public policy?

SHAPIRO: Yes, that's right.

CARUSO: Eighty-seven is that because of the grants that you were working on, or is there . . . ?

SHAPIRO: Eighty-seven?

CARUSO: It says '77 to '87 as . . .

SHAPIRO: **[**Yes, and it was in that period that I began to develop a more serious interest in national economic policy through testifying before congressional committees, etc.].

CARUSO: So what brought up that interest in policy?

SHAPIRO: Well, the kind of models we were building are [principally of] use to people who are in policymaking [roles and what some further insight on the impact of alternative policies on

the short-term economic outlook. We believed that our forecasting models were most useful in comparing the effects of alternative policies. These are natural questions for policymakers to have. Not only the overall impact of alternative policies, but which sectors would be most benefitted]. We were [generating quarterly forecasts] two or three years ahead [under alternative policy inputs. Our focus was] to compare situations where the levers of policy were set at different spots [and investigate what difference would it make]. That was [. . .] how I [developed] my interest in policy. [. . .] Even my thesis at Princeton concerned a model of the Canadian economy where I tried to model the behavior of the Central Bank and try to understand [just how] the Central Bank behaved, and what difference it made. That was the nature of the thesis I [wrote] at Princeton, [but it was based on a relatively] crude model compared to what we eventually developed at the University of Michigan.

CARUSO: So I want to talk about your transition into provost, but something just occurred to me that I wanted to . . . that I hadn't thought to ask: did . . . so two of your daughters were born in the United States, correct?

SHAPIRO: Correct.

CARUSO: So they were American citizens. The other four of you—your wife and your other two daughters—did you become citizens after a while?

SHAPIRO: Yes, we did in [the late 1970s].

CARUSO: Is that the point where you just accepted that you were going to [remain in the US] . . . ?

SHAPIRO: [Yes, but this was not an easy decision, but deep down given the development of our careers, we really did not expect that we would return to Canada, but it took us some years to make this decision. It was very helpful that Canada decided in the 1970s I believe that we could have dual citizenship since this took some of the emotional matters out of our decision. We became] dual citizens [with both] Canadian and US passports. I haven't used my Canadian passport in twenty years at least—maybe thirty years. But yes, we have dual citizenship—all of four of those of us who were born in Canada have dual citizenship.

CARUSO: Okay, so what brought about the provost position at the university?

SHAPIRO: [. . .] I had been chair of the economics department the three previous years. And [while I certainly took my responsibilities seriously, the Economics Department rotated its chair every three years, and everyone was expected to take their turn. I was relatively young, but this was not a career changing decision or appointment]. So I did serve three years, and at the end of those three years, **<T: 75 min>** my wife and I decided to take a two-week vacation with her family up in northern Michigan—there's a lot of lakes up there and so on—so we rented a cottage at a lake in northern Michigan. About a week into this vacation, I get a call from the president of the university [R. W. Fleming], who says, "Well, the provost of the university—at that time Frank [Harold Trevor] Rhodes—is now [leaving] to become president of Cornell [University], and would you consider becoming provost?" This is over the phone; I'm sitting in a cabin in northern Michigan, so I didn't know what to say. I didn't know what a provost did; I never knew a provost and hardly knew the dean. I didn't know what to say, but it was the president of the university, so I said, "Well, I'm due to come home [to Ann Arbor in another week—what] if I see you . . . come by your office a week from now?" [By that time, I might be able to inform myself a little bit about the position. However, he responded], "I think a week a little too long; I think I'd like to see you earlier." So to make a long story short, [the next day I left my family and drove myself back to Ann Arbor—about two hundred miles. The following day I realized that] I needed directions to his office; I didn't know where the president of the university hung out, where his office was. [As I entered his office somehow, he made me feel very comfortable. As I got to know him over the subsequent years, I came to have great respect and admiration for him. He began our first conversation by informing me that Frank Rhodes—the current provost—was leaving Michigan to become provost at Cornell. In fact, I knew Frank moderately well not through university affairs, but through parent/teacher meetings over the years since we had children of the same ages]. I knew he was a geologist, [but I had not realized] he was provost.

So the president described to me what the provost position is, and I, sort of, get the general idea of what it is and how it relates to the deans and so on and so forth. [. . .] And he says to me right there . . . he says to me, "And I'd like you to [assume this position]." I said, "Well, I need some time to think about it; I need to speak to my family and so on." [. . .] Of course, such informality is, you know, out of the question these days—probably all for the good. So I said, "Well, you have to wait. I [cannot] give you an answer now. [My first priority is to] speak to my family. I'll be back in town in a week or whatever it was—five days at that time—and I'll let you know [then]." I drive back up [to our rented cottage in northern Michigan], and I begin discussions with my wife, and my wife said, "Well, as long as you don't have to leave town, I'm not against it." She said, "I'm not leaving Ann Arbor [until] all children are through high school. Period." So she [repeated], "If you don't have to leave town and you think you might like it, try it." I spent the next few days just calling people I knew at the university and asking them what they thought about this, [if they thought I] might be any good at this, and so on, and they were very supportive. When I got back to town, I went to see him again and said, "Okay, I'm willing to consider it, [but I needed to know some details ranging from the general nature of my responsibilities to issues surrounding compensation, etc.]. I'd been chairman of my department, but that was just a rotating [responsibility]; I'd never been a dean, I've never built a big [new program up in my department]. I mean, in three years, you don't build [big new programs]. And what on earth possessed me to say yes and [how] I even [imagined that I could

take on this major responsibility for an institution the size of the University of Michigan. At that time Michigan had] twenty-five thousand employees, and [the provost was] in charge of the budget of the [entire] university—[including the medical center and some responsibility for relations with the state]. Anyways, I took a chance, accepted the job, [. . .] and did the best I could. That's how I got started in university administration.

CARUSO: Do you . . . did you find out at any point why your name was on the list for provost?

SHAPIRO: I didn't find out exactly, but [over time] I did inquire a little bit about [it. For two years or so I had chaired the faculty advisory committee on budget priorities], **<T: 80 min>** so I knew a little bit about the budget and roughly what some of the [key issues were but this committee had little influence on the university's budget decisions. Nevertheless, perhaps that is where I got started dealing with university priorities].

CARUSO: And you know I'm not trying to trivialize things in any way, but I'm curious to know whether or not your experience in those several years after college running the family business—did they apply to what it was like to become provost?

SHAPIRO: Oh, I think it applied a little bit, [but it is very hard to assess. I knew what it meant to "meet payroll" and other financial obligations, but in realty the restaurant was a very small organization. As I remember we had something] like 220 employees. The University of Michigan had twenty-five thousand. I mean, it's just a totally different world [from an organizational point of view and many other perspectives].

CARUSO: And so, your position as provost. You have it listed as '77 through '79. Where those academic years or calendar years?

SHAPIRO: Let's see. I think it's a . . . I think it's July '77, I think, is when I started, and I think January 1, '80, I was president—something like that so that's about two-and-a-half, three years. [. . .] The president had told me when he asked me to become provost that he was thinking of leaving; he was very honest with me—he [told me very early on that he was] thinking of leaving in the next few years. At the time, [this never bothered me; I never thought I would become president, and the provost position might not last too long]. One thing I always [reminded] myself about is when I came to the University of Michigan as a young faculty member not only I didn't know who the president was; [moreover], I didn't care who the president was. [laughter] I always reminded myself about [this to reinforce the notion that the real work of the university remained in the classroom, the libraries, and laboratories. For most faculty, staff and students this is a distant and not critically important position. Reminding

oneself about this reality helped give me an appropriate modesty] about what I could accomplish [and what partners I would need]. I think leadership matters—but you [move ahead only with the support of many others]. The first interview I gave after I became president of the university was to the student newspaper, and this young man—young man and young woman—came to [my office] and the young man says to me, "Well, aren't you afraid that during your time as president here, you'll wreck the university?" Or a question like that; I mean, he may not have used those [exact] words. But I remember what I said. I said, "Look, [the university is] like a big ocean liner. I can do a little [to] move it in one direction or another, but I can't turn it around." I said, "It's got its own momentum, which [is sustained by the work of students, faculty and staff that are providing the underlying momentum and general direction of our programs and it is their work that provides our forward momentum. I hope I will be able to help a little. Perhaps I will] change a little direction here and there and [I] hope that will be helpful, but I can't wreck it." [. . .] [It is] always helpful to remember [that while modesty is appropriate so is the leverage of ideas that come forward and perhaps I could help a little in that direction].

CARUSO: You'd mentioned that when . . . your first economics course at McGill, the president of McGill, I think, was teaching.

SHAPIRO: Yes, that's right.

CARUSO: When you moved into the provost position and then later the presidency, were you able to stay connected to students in a similar way? Were you teaching classes . . . ?

SHAPIRO: **[**In most years I taught at least one course. In my recollection] I never taught any **<T: 85 min>** more than one. [So in a modest way I continued teaching over these years]. I told my wife [that I expected to return to teaching before I retire. I started as a faculty member and that's where I want my career to end. When I reached] sixty-five, my wife looked at me one day and said, "Well, if you want to go back to teaching, you'd better do it [soon] because time moves on." So that's why I retired from Princeton when I did because [there was still time and capacity to return to the faculty]. It seemed two things coincided: one, my [consistent] claim that I wanted to go back to teaching and my wife's constant reminder that it's good to quit when you're ahead and things were going well at Princeton at that time so it [was] a good time for the university to make a change.

CARUSO: So what . . . how did the transition to the presidency at Michigan happen? Was it the president retired and . . . ?

SHAPIRO: The president retired. I don't know the details. I can only know what I encountered [and experienced]. What I encountered was I had one [interview-type] meeting, which seemed

to have some regents of the universities, some faculty and a student on the committee—or two students; I can't remember [its composition in detail]. I had one meeting with them, and presumably they had meetings with other [candidates]. I'm sure in the archives of the university that's all noted down somehow, and the next thing I knew is I heard from the chairman of the board of regents at that time that they would like me to consider [becoming president of the university. I never inquired who the other candidates were]. I'm sure they did consider others. [The regents of the university] somehow decided that maybe I could [lead the university as its president. These were] very difficult years at Michigan because that impact of the two oil boycotts in the early [and then in the late] seventies and the late seventies [had a very large negative impact] on the state of Michigan, [creating very serious financial challenges for the State and State-related institutions].

CARUSO: In the position—both positions—both as provost and president, were you still able to do the policy work that you had been starting and liked . . . ?

SHAPIRO: Yes, I was, I think. I don't remember all the exact dates, but yes, I was able to do policy work because I was able to spend time in [Washington although I never lived there. In my Michigan days it was only a one-hour flight, and it was in the pre-9/11 days when it was easy to leave Michigan in the morning and return that night]. Those were before the TSA [Transportation Security Administration] was around, and so you could just rush into the plane in the last minute and be just fine; [one could not do it so easily these days. Moreover], the regents of the university encouraged me to spend some time both in Lansing, [Michigan] on state policy and in Washington on federal policy because they understood very well that parts of our university—parts of most research universities—were dependent on policies being followed in the science and technology area in Washington. [A quick and obvious example the health of the National Institutes of Health (NIH) budget was critical to our research enterprise in Ann Arbor. Moreover, the shape of federal financial aid policies was also important for us. I could cite many other examples regarding the health of other federal agencies such as the NSF or National Aeronautics and Space Administration (NASA), etc. The regents of the university certainly were very sensitive to this and] they thought that that was an appropriate role for the president of Michigan, so they were very supportive in that way.

CARUSO: I know that we've been going for a little over an hour-and-a-half. Do you need to take a break to get some water or anything like that?

SHAPIRO: No, I have a Coke here, but I'm not thirsty right now.

CARUSO: Okay, I just wanted to. . .

SHAPIRO: What about yourselves? **<T: 90 min>** You might want to take a break.

CARUSO: I'm fine. Kenny?

SHAPIRO: You're muted.

CARUSO: You're muted, Kenny.

EVANS: I am going to just turn my video off for thirty seconds, but please feel free to continue.

CARUSO: So, you know, my next set of questions is going to be about your move over to Princeton, but before I do that, I wanted to just sort of turn things over to you. Is there anything that . . . you know, we told you a little bit about the project—the Presidential Council of Advisors on Science and Technology—is there anything during your time at Michigan that you think would be relevant for us to know given the nature of the overall project? Connections to . . . you'd mentioned having the grant at the NSF for quite some time. Did you have other people that you were . . . ?

SHAPIRO: I can't [immediately recall all the issues that I was involved with those many years ago, but I could give you at least one other example]. Representative [William D.] Ford, who was at that time a member of Congress [from Michigan] was very important in [guiding] the student financial aid programs of the federal government. He essentially shepherded them through the House for quite a few years. He was probably more important than anyone in Washington for [. . .] their maintenance and [any new initiatives being contemplated at the time, and I spent quite a bit of time with him and his staff discussing new initiatives in this arena]. I had many discussions with him on student financial aid and what the federal programs might be or ought to be and so on. [I have to note that when I left my position in the Department of Economics and moved to senior positions in the university administration my interest in federal policies that impacted higher education sharply increased. In addition], when I left the department and [became provost] and then president of the university, I was looking around for a subject that I might continue to involve myself with in economics that wasn't moving ahead so fast that I could actually keep up and play a [useful] role. In the area of econometrics, which is where I was working initially, that field was evolving so quickly that I just couldn't keep up with work that was going on, so it was no use me trying to teach graduate courses in econometrics anymore because I just wasn't up to date enough.

The subject I landed on [. . .] was technology transfer, [and how new technologies moved across time and space. In particular, I began considering the chasm] between scientific

discovery and economic impact. There's a whole series of institutions that intervene here, and one had to account for them more carefully than most economists and most universities [had done to date. In those years most universities projected themselves as both making fundamental discoveries that initiated further economic growth in their regions. My general assessment of such policy claims was that they were somewhat naïve. Certainly], scientific discovery is extremely important [both for its own sake and for the potential it might have to stimulate further economic growth either at home or abroad, but a vast chasm existed between discovery and new economic growth, and it was not necessary for the discovery and subsequent economic growth to be in the same geographic area]. It was very common in those days for university presidents to say to their state representatives, "Look. If you spend money here, it will be returned to you tenfold because of all the wonderful things that occur after [your geographic area enjoys the ultimate dividends of these research expenditures]." I thought that was very naïve way to look at it. I thought [. . .] you had to have a much more sophisticated way to think about how discovery—scientific discovery—in the lab gets transferred into some useful economic activity.

And so I began **<T: 95 min>** working on that area trying to make the point to—for example—my colleagues as [university] presidents that that what the [claims they were often making to their local legislators were often exaggerated. Certainly, if you spend public money on research—or anything else—there's] an immediate benefit [whether you spend it on bridges or laboratories]. It has an economic impact right away. [But it took a lot more thinking to answer the question regarding the optimal expenditure patterns for either federal, state or local authorities. Moreover, the claim often centered on studies that assessed the return on scientific research as somewhere between 20 and 40 percent. I found this estimate just unbelievable. These ostensible rates of return on research often followed a "residual approach" that tried to estimate the contributions to growth of other factors and attribute to research everything that was left unexplained. In my mind this led to unbelievable estimates of the rate of return on scientific research. The challenge of estimating the rates of return to investments in scientific research is a very difficult one, particularly if one is concerned about the rates of return in a particular region since ideas travel around the world very quickly. I have remained interested in this problem. From a more general policy perspective this taught me not to try to stretch evidence beyond one the data really support because this may involve you in the misallocation of scarce resources that governments have at their disposal. My efforts in encouraging my fellow presidents to be more modest had, as far as I could tell, very modest impact. Indeed, I often felt that my colleagues had very little sensitivity to the very difficult choices policymakers confronted. In any case, this issue led to my increased interest in various aspects of public policy that impacted higher education in both the research and teaching arenas].

CARUSO: Yeah, I think the only thing that comes to my mind when talking about innovation, technology, science and technology policy is, you know, some of the work that I did in graduate school where I think we were still using—I'm blanking on the **<T: 100 min>**—Everett [M.] Rogers's work on the diffusion of innovation. I don't know if I'm remembering that correctly, but so, you know, there's certain things that you need in order for innovation to spread in

communities and the development of that, so my understanding of those . . . of policies quite limited just to that knowledge there.

SHAPIRO: Well, that's right. It is hard. [Understanding how innovation spreads across geographies is especially difficult. The longer I worked in the policy arena the more modest my claims became].

CARUSO: Yeah, yeah. So, anything else from your time while in the provost or president position at Michigan?

SHAPIRO: No, [I cannot think at the moment of any further matter that might be of interest to you].

CARUSO: So clearly all of your children finished high school, right? Because in [late 1987] you did go back to Princeton.

SHAPIRO: [Yes, and none of our children were living with us at the time].

CARUSO: So, can you tell me a little bit about how that came to be—going back to Princeton as president?

SHAPIRO: Well, yes, I can tell you how it came to be to [the best of my recollection]. I'm of course not knowledgeable of [. . .] all sides of this [issue]. I had arranged with the University of Michigan for a two-month sabbatical. I think it was January and February—I want to get this right—it must be January and February of '87. And so we . . . my wife and I decided we would spend one month in London, [England], and one month in New York because the Ford Foundation had asked me to review their program in higher education. And so they arranged for me to spend one month in New York and [just prior to that we spent a month on our own] in London. [Back in New York] the Ford Foundation arranged for us to have an apartment in [the vicinity of their headquarters. Shortly after our arrival in New York I received] a call from Bill [William G.] Bowen—he was at that time president of Princeton—telling me that he was going to retire [as president of Princeton. I] was very surprised to get the call [since I did not know Bill Bowen all] that well. [. . .] He told me he was going to work in the Mellon Foundation, [but at the time I wondered why he called me since it was the first] time he ever called me about anything, and so I [. . .] wished him [well and expected to hear no more about it]. Well, within days of that call, I get a call from the chairman of the board at Princeton [indicating that] they are looking for a president [and would like to speak to me about what Princeton needed in the years ahead. As you know], this is the standard opening play in these kinds of searches, and I

[have been] around long enough to know that that's what that was. [In any case I agreed to meet him for breakfast in New York City].

So he came to New York and I met him, and we had breakfast and we talked, and I told him what I thought about what little I knew [about Princeton's current role in higher education], what kind of reputation of it had and so on and what I thought about [its future role. It was a very general conversation, but I thought my observations on the current status of higher education and Princeton's special role might have been of some help to him. I was aware that] Princeton had a long tradition of appointing presidents from within the university, which I assumed that they were going to [continue]. I left that meeting feeling that was that; I mean that was the end of this conversation [on Princeton's future. Nevertheless], maybe a week or ten days later [. . .] he calls me back and he said, "Well, we had a very interesting conversation, [but I would like to speak] to you again." And so we go through this whole thing all over again: [we] meet him exactly the same place in New York City and we have a talk and, finally, [. . .] he said, "In fact, we're interested in whether you might take a position if you [were offered] it." He didn't offer me the position then. He said, "If you might be interested." And I said that was a big decision; I really didn't know, and I [would have to give this very careful consideration, talk with my family, but I could not be rushed into making such a decision. **<T: 105 min>** He responded] "No, we're not in a rush." By this time, [my wife and I are ready to return to Ann Arbor. Some weeks after our return to Michigan I received a third call from the head of Princeton's presidential search committee suggesting that I was a serious candidate and they wished to visit me in Ann Arbor if there was any possibility that I was interested. This time I met not only with the head of the search committee but one other trustee and a senior Princeton faculty member].

[It was with this visit of representatives from the search committee that my wife and I began to take this opportunity very seriously and after this meeting we asked for a visit to the Princeton campus, which I had visited only once since my PhD years there. We'd] like to see the campus and get a feel for it." [We had been in Princeton during my years as a graduate student—1961-1964—and Vivian did not like the town at that time feeling it was much too conservative. Nevertheless, we had heard that this had changed a great deal so we] visited Princeton, came back home, and waited to see what happened. Well, within a relatively short period of time—again I don't remember the exact details here—they called, and the chairman and the vice chair came out to Ann Arbor again and said, "We would like to offer you this position." Then we really had to make a serious decision. And I'll be honest with you: my wife was very hesitant to go back to Princeton. She had this vision of Princeton [circa 1961] as a very conservative place [. . .] and despite the fact that they tried to impress on us things had changed—it was now co-ed etc., etc., etc. [. . .] Well, I can't go through all the discussions that we had; it wouldn't be very informative for anybody, but frankly [speaking it was a generous act of faith on her behalf that she agreed that we could return to what she hoped would be a "new" Princeton. In the end I think she decided to do a big favor for me since I still think that if it was up to her at that time—1987—she would have preferred to remain in Ann Arbor. One evening she said], "Okay, [if it is] something you want to do, I'm willing to try." [. . .]

To me, looking just where the university was at that time—where Princeton was and where Michigan was—I thought I could make a difference in a place which had a greater concentration on undergraduate education, which just by force of numbers, as you know, doesn't take a big part of the president's time at [Michigan]. You're too far away from . . . you know, I was in a six-story building in Michigan with the president, the provost, and a bunch of other vice presidents and so on. Then below them [at other locations] there was a whole bunch of other deans, then the [departmental] chairs . . . I mean, [as president] you were far away from what was really going on in the ground unless you made a real effort, and even then there were limits to what you could do. And I thought here is a place where I can have a more direct impact—more direct relationship put it that way—with what was going on in the ground, in the laboratories, and in the classroom, and I [admired their continued] focus on undergraduate education. And so it seemed to me like a good fit to try and really my wife's goodwill more than anything else settled the issue because otherwise I certainly wouldn't have gone if she hadn't agreed. [. . .] It turned out we liked it [back in Princeton] very much. It turned out things that changed a lot. [. . .] We found the trustees to be very [forward looking and liberal-minded and willing to face up to challenging academic and social issues]. Much to [Vivian's] surprise, we really enjoyed it [at Princeton]. Otherwise, when I retired, we would have either gone back to Ann Arbor or gone back to Montréal when I retired as president, but we didn't do either, and so we're still here.

CARUSO: Now I know it was **<T: 110 min>** . . . so it was 1990 that you first started with PCAST. Is that correct?

SHAPIRO: I [do not remember the exact year]. You probably have a better idea than I do.

CARUSO: Okay, well, so let me start with this. How did you first . . . who inquired with you about participating in PCAST?

SHAPIRO: You know, I think it was [D.] Allan Bromley. Now I don't have a perfect recollection of that, but I think it must have been him. And [yes], I'm pretty sure it was him. He at least convinced me to join [even if he] wasn't the one who initially asked. [. . .]

CARUSO: And did you have an awareness of PCAST prior to that?

SHAPIRO: No.

CARUSO: No? So this was . . . so in asking you to participate—if it was Bromley, if it was someone else—what . . . do you remember what you were being asked to do?

SHAPIRO: [Our initial agenda was not fully worked out], but the idea was that we would have access to the President and [would help inform his agenda regarding the federal investment] in the science and technology. [This raises an issue which I wanted to discuss or at least make a specific observation about. I've served on a lot of advisory committees dealing, one way or another with the on-going federal investment in science and technology. One thing I have learned from this experience is that appropriate access to the president is critical. In the years I served on PCAST our success was critically dependent on our leader Allan Bromley's access directly to the President. Professor Bromley's role involved full-time work on the While House staff with a suite of offices in the Executive Office Building].

What was critical to [PCAST's successes was his appropriate] access to the President. [. . .] Allan Bromley could call the President and get to see him within days or some reasonable period of time. That is, in my view, [such access by the committee chair is central to the committee's success. Many presidents'] advisory committees can never get to see the president. [The committee is just not a high enough priority. We all understand that the president of the United States has many priorities, and the president cannot satisfy each and every community of interest. However, from the perspective of a potential committee member who may be asked to spend a significant amount of time on the assigned task, some sense of the committee's importance to the president's agenda is important, as well as direct access to the president when appropriate. Often the access of the committee's chair is quite sufficient. It was remarkable to me that a single visit of the President to a committee's meetings—even a very brief visit—can elicit a great deal of work and enthusiasm from the committee. If such contact is not available, it is doubtful that the committee's efforts will yield dividends in terms of impact on policy]. You may have a good time relating with your colleagues, all of whom are very interesting and lively people, and you may even publish something that has some impact in the field, [. . .] which is a very positive thing to do, but if you're asking, "Are you going to have an impact on public policy?" during the term of this president whoever it happens to be [is doubtful. There are of course other influential forces when it comes to policymaking in the Congress and Federal agencies. But a presidential advisory committee often does not have direct access to these important influencers. One effective practice might be to require Federal agencies to respond directly to any recommendations of a presidential advisory committee. However], when you can see the President on a periodic basis, everything changes. People know you've been there to see the President; people know what you've said—it's never any secret and this filters down into the system. [. . .]

When I served as chairman of the National Bioethics Advisory Commission [NBAC] during the Clinton administration, the key was can I get to [see the President for a few minutes from time to time as appropriate? For some additional perspective it is probably true that in some cases the key person might be the head of an agency and access to them would be much easier if they knew you also had some periodic access to the President. The key is thoughtful responses to recommendations from the most appropriate sources. In such cases something might actually happen]. So, to take another example, **T< 115 min>** working on the same committee—the National Bioethics [Advisory] Commission—the issue there . . . let's say

you're dealing with an issue like human subject research. [. . .] The key there would not be so much to see the President, but [to have serious interaction with NIH by requiring a response to whatever recommendations you have and/or serious interactions with NIH on such issues as human subject protection. If you also have the President's ear from time to time, you are more likely to get helpful responses from the Federal agencies. In the end, every committee hopes that their recommendations do not] just disappear into their voluminous files [of the federal government]. In my experience, [these committees are made up of very intelligent and thoughtful people who want to make some difference that would make the nation a little better]. I've never met anyone on these committees that I thought shouldn't be there or didn't know [or care about their assigned task. They were there only to help the country make useful policy decisions. They always recognize that the nation's priorities are vast and complex, but perhaps their recommendations might help navigate these difficult and turbulent seas].

[While every advisory committee has a somewhat unique role it is important to inquire just where it "sits" in a vast bureaucracy with an equally complex set of priorities and interests. Nevertheless, if you are asked to serve on a committee, ask where it might get its influence from. I recall chairing a committee reviewing] the internal structure—the structure of NIH—and what role of the director of NIH had versus what role of the heads of the [internal] institutes have. [We were tasked to undertake] a study of NIH—its structure, its administrative structure, [the role of the director and the relationship of the director to the heads of the institutes, etc. If such a report was being submitted to the NIH itself you might want to save yourself the effort, but if it was being requested by the Secretary or the relevant committees of Congress you will be on much better footing than if this] was going to NIH itself, you might as well save yourself the time and effort. If you were talking not to the heads of NIH but [. . .] to the Secretary, the head of HHS [the Department of Health and Human Services], there's a whole different world as to what can happen and what will happen. So, that's at least my experience.

CARUSO: So I'm going to turn things over to Kenny; he's a subject area expert on PCAST, so he'll be leading the questions, but I may still chime in.

SHAPIRO: All right. I remember PCAST well.

EVANS: Well, great. Thank you, Dave. Yeah, so your discussion on needing, you know, the attention of the President, kind of, begs the question for Bromley and G. H. W. [George] Bush's PCAST: did you feel like you got the time you needed with the President or other . . . ?

SHAPIRO: **[**My experience at the time] was that Bromley [. . .] had pretty free access to the President at that time. [. . .] He was always able to either deliver something or tell you we weren't going to get it delivered. It's not that we could do anything we wanted or anything like that, but he had access to the President, and **<T: 120 min>** you know, people do things for symbolic reasons. [Let me give you an example of symbolic support which was, in my view,

important]. While I was a member of PCAST, we had one meeting at Camp David, [Maryland] where [we met with the President and had an interesting set of interactions with him. When I ask myself what exactly was accomplished at that meeting the answer is in the nature of goodwill and increased interest in the committee's agenda. When the President of the United States gives a committee that much time, committee members respond by deepening their commitment to their task]. Did a lot of work get done [. . .]? No, a lot of work didn't get done; there's too many distractions at Camp David to think that any work is going to get done but that [visit meant a great deal] to members of the committee. They really felt [very honored or that our task was honored by the direct interaction with the President of the United States. Ceremony means a lot to people even down to the nature of the rooms assigned for their meetings].

[It is my casual observation that attendance at Committee meetings is impacted by the nature of the location of the meeting. If the committee meets in the Eisenhower Executive Office Building or the home of one of the federal agencies, attendance by both the public and committee members is higher as compared to meeting in the basement of a hotel or other non-descript location, which seems undermine everyone's intellectual energy]. Symbolism means a lot to people who are very busy and could easily be doing something else. [My observation that the kinds of people attracted to advisory committees] are very talented, very busy people [and a simple way to reward them for their service is to have them meet in places that reflect the importance to their work. For example, when I was chair of a committee dealing with the structure of NIH, we met at the NIH where we could easily summon many of NIH researchers to meet with us and visit their laboratories].

EVANS: Yeah, I mean the Camp David meeting is very historic as far as PCAST.

SHAPIRO: It's unique as far as I know, at least for this kind of committee. [. . .]

EVANS: Did you then meet . . . in terms of this symbolism, did PCAST then meet in the . . . ?

SHAPIRO: [PCAST typically] met in the Executive Office Building. [In my memory we also met once or twice in the Roosevelt Room in the White House. The latter was quite unusual and not necessary. It is also important to note that this was not in an era where security requirements in government buildings was not quite so strict as is currently the case]. **<T: 125 min>**

EVANS: Were there . . . so coming into PCAST, were there issues if you did have the attention of the President that you thought PCAST should be working on or things you brought to PCAST?

SHAPIRO: No, [as I saw it we had broad discretion as to construct an agenda. However, we were informed that the President had no interest in anything related to population policy. The President and the administration did not want us to address issue related to reproduction. Somehow the committee accepted this constraint. On reflection I believe it was the case that no committee member was concerned with this constraint. My] recollection was that we had a pretty open agenda when we began. Bromley undoubtedly had ideas, and I'm sure his ideas were [. . .] very important to us. [In any case], I looked at him as a messenger of the President and if he had an idea that we ought to work in this or that area that was a pretty good signal that we should try to be responsive to that. But, you know, [. . .] one of the problems with the way the US civil service works is all the key positions get changed every time there's a new president, so you go over and over things, right? There's nobody [in the most senior positions] that said, "You know we did that last year with a Democratic president or a Republican, whatever the case may be." There's no really good memory at a very high level in the . . . in my opinion . . . in the what I would call the civil service, public service, whatever we call it because so many of the appointments, as you know, are made . . . are political appointments. Some of them are very good appointments. [Perhaps at some level Bromley was a very good appointment and leader but there is always some political dimension to such offices].

EVANS: The question is if there were particular issues that you felt needed presidential attention.

SHAPIRO: What years was I . . . that I was in PCAST? Do you remember?

EVANS: Nineteen ninety was the year it started. [. . .]

SHAPIRO: [A perennial issue is a focus on just what level of investment in science and technology is appropriate for a country of our size, given, for example, the level of defense spending we somehow need to sustain, or our Social Security obligations. Bringing the nation to a broad agreement on such broad-based issues has eluded us].

EVANS: No, no, it's all good. I'm really curious about what you remember because these reports are historical interest to me and to Dave, so just curious what your thoughts were going . . .

SHAPIRO: [I enjoyed the time I spent on such advisory committees. I both liked and admired other committee members and learned a lot from them. Moreover, the reports we issued were by and large helpful for those charged with setting our national agenda in the R&D area. In some dimensions the challenges we dealt with are still with us today. What] is the optimal level of our federally sponsored R&D [research and development] in this country? How much in <**T: 130**

min> R, and how much in D? These are the standard everyday issues, which are yet to be [fully] resolved. [. . .] In these advisory committees, it's very hard to prevent them from wanting to make policy [even if this is not what they were asked to do]. If you [are a member of] a scientific advisory committee, you have one [big] thing in mind: the health of the science and technology enterprise. [. . .] The average congressman doesn't have an agenda like that; I know of no congressman that has that as an agenda. What they have is a lot of different agendas dealing with everything from roads to health care to social security to defense. I mean science and technology, yes, [many members of Congress care about this] but they have [many other legitimate concerns. Many of these presidential advisory committees often] get to a point where people are trying to take the role of a congressman or try to anticipate the role of a congressman or trying to write a report that is likely to appeal to different groups in Congress, as opposed to just what you think about this [overall scientific agenda]. It confuses the role of the advisors in science and technology and the congressional responsibilities that congressman have, and there's just tremendous [difference in the scope of their agendas].

So to give you an example [from my experience as head of the National Bioethics Advisory Commission. We had been asked to suggest any policies that might be appropriate in dealing with nuclear transfer cloning. It is hard to recall how upset the public was when the Dolly the sheep experiment was announced. Today this is a very "sleepy" issue, but at the time many in the public were very hysterical. For a brief few months, the national media was covered with concerns that we would now create many Einsteins or Mozarts or Babe Ruths and we were given sixty days to provide advice to the President regarding this new technology. The matter was discussed daily in the media. The President may have turned to us to get our sage advice or just as a tactic to delay any ill thought or congressional action. It was immediately apparent to the committee that any issue dealing with reproduction inevitably was tied to the issue of abortion and our committee meetings further reinforced this issue. Nevertheless, the committee proceeded as best it could to keep the focus on the new technology and what it meant to society. We were assigned to make recommendations regarding the implications, if any, of this new technology. As the committee discussions proceeded it was hard for the committee members to begin projecting how key legislators might react and to shape our recommendations accordingly. Nevertheless, I hope we were successful in bringing out discussions and recommendations free of this temptation and remind ourselves of our limited role. I had to remind us to not confuse our role with the role of the Congress or the administration. At times it is difficult to keep advisory committees focused on their role and not to assume they have new powers. And so I think it can be challenging] to keep the scientific experts or the scholarly experts focused on what they know and not on what they wish or how they would anticipate what the political reaction might be, and so on. [At times this can be challenging, but it seems to me that] the closer you get to a controversial issue, the bigger [this challenge can become].

EVANS: So for PCAST then, did you guys have an idea of who, you know . . . did you have . . . were you intentional about **<T: 135 min>** who you were writing your reports for?

SHAPIRO: Well, yes, [in my opinion], we were writing them [for the President's consideration. I cannot] speak for everyone else in the committee, [but that was my view and further communications from the committee to the President was primarily Bromley's responsibility. At the same time, we were operating at a particular point in time and the committee had to be aware of where our views fit in with the general challenges faced by the administration. This was somewhat different than my experience with the National Bioethics Advisory Committee where resource constraints were not such a dominating issue. With PCAST we were always conscious of how OMB [Office of Management and Budget] would respond to our suggestions amid many larger concerns, while for the National Bioethics Advisory Commission this was not a major concern. As we all know, OMB is very important in budget allocations and for PCAST this was very important, but not for NBAC. The President's budget is critical for PCAST's concerns, but much less so for NBAC. In any case, my recollection is that Bromley was our very effective messenger to OMB and the President].

EVANS: I'm curious you were speaking earlier about being, kind of, realistic with regarding you know the returns on basic research. Did you in PCAST or another—I know you're involved with AAU [Association of American Universities] and AAAS [American Association for the Advancement of Science] and other—did you find, kind of, allies in that [perspective]?

SHAPIRO: Yes, [but not very many. In retrospect I think] Ralph [E.] Gomory [was my best ally on this subject. As you may know, Ralph was head] of research at IBM [. . .] for many years. Then he was chairman of the [Alfred P.] Sloan Foundation after that. So he had a very, very good idea of how new ideas get implemented and get results. [IBM had a very high-quality research operation, and he knew] how long it took and what transformations took place between someone having a really clever idea in the research department and something happening [to] a piece of equipment. [. . .] [Moreover], he's very articulate and very tough-minded. He had a big influence [on PCAST's recommendations].

EVANS: Thanks. Now I'm wondering you mentioned, and I know that you were appointed vice chair at some point, how did your responsibilities change, or, kind of . . .

SHAPIRO: Very little really. I think David Packard just did [not] want to travel quite so much. [It was my impression that] he was at a stage in his life where he really wasn't either willing or able to really put some of the work in that required the committee to [function well]. I was never told [the reason for his decision and I had the role to partially fulfill his responsibilities. In fact, my role did not change a lot since the staff took up some of his responsibilities].

EVANS: Were there PCAST reports that, you know, that stood out to you or writing or . . . ?

SHAPIRO: [I am embarrassed to say that I did not review these before this meeting so I do not want to pick out one or two at this time]. **<T: 140 min>**

EVANS: That's okay. Yeah, I mean, we would obviously love to speak with you again, and I'm also happy to send you the archives on PCAST if you'd like.

SHAPIRO: Yeah. I think—I'll check it—I think I have copies. At my stage of the game, you're deaccessioning stuff in your library, you know, that you've kept all these years. [I do need to revisit this matter].

EVANS: No, no it's completely fine. I . . . you know, one of the interesting things about this project is speaking with people. PCAST is somewhat of a niche topic.

SHAPIRO: To put it mildly.

EVANS: So any, kind of, viewpoint is helpful, but well, this kind of . . . it makes me curious if, you know, since your time on PCAST if you've followed their work or had a perspective on what PCAST was . . .

SHAPIRO: I did in the immediately following years but not much since then, and you know, one of the things that happens, unfortunately, when you reach my age, most of the people you work with and have worked with you either are fully retired, or worse. [I did follow the leadership of Chuck [Charles M.] Vest carefully, but not much after that].

EVANS: No, it's all good, and well, I guess, I was going to ask . . . oh yeah. Before I forget, you'd mentioned meeting in the Oval Office and then also Camp David. Were there . . . did you have a security clearance? Were there . . . were the meetings open to the public?

SHAPIRO: [I have little memory of these matters, but my recollection is that we had to submit the same kind of materials as any visitor to the White House. A lot may have change over time. There were conflicting winds at the time between being open and necessary security matters. Over time I think security has won out. In my years working on these advisory committees, I never found the security issues a serious problem]. To be, you know, honest with you, the most irksome thing that happened in all these committee meetings is when the government issued a new rule that if you had, say, coffee in the meeting room [which was open to the public], the public could not share in the coffee available. [. . .] It was the most ridiculous possible scheme. [laughter] I mean, these are people you would hope to build some goodwill with and [are

presenting expert testimony and] you're going to save [eighty-seven cents for a few more] cups of coffee and . . . it was so irrational. [It was, in my opinion a typical example of saving pennies and foregoing goodwill while billions disappear at other venues].

EVANS: Draconian.

SHAPIRO: It's like what happens on a lot of government regulations: you save a dime here and there and tens of millions flow out in other ways you can't see so easily.

EVANS: Yeah. Well, I'm wondering . . . so, you know, you had, kind of, said that the questions haven't changed so much in terms of federal science policy: who gets what and when and divisions between R&D **<T: 145 min>** and basic R, applied R. Are you . . . you know, PCAST is now in its—well, it has a longer history—but in its, I guess, sixth edition in the Biden administration. Are you . . .

SHAPIRO: There's one thing that's very important that's changed, and that is the importance of federal versus corporate research and development. As you know, [. . .] the proportion of the federal government's investment keeps declining and corporate investment keeps rising. If I were in PCAST right now or if I was asked about what PCAST might think about, there's something that we weren't thinking through carefully. The data is available; I don't know what the answers would be here, but somebody should be thinking very carefully about what this means for the health of the R&D sector. Now I just went through a very [thoughtful report] [. . .]—*The Perils of Complacency* from the American Academy of Arts & Sciences.[1] [This was generated by an excellent committee headed by a very distinguished chairman and this report also took note of this development. However, I do not know of any serious government report that focuses on this issue. We badly need some serious examination of this issue to decide whether this is a problem or not. If I were a member of PCAST now I would suggest some serious attention to this development. I am not certain if this is a worrisome development or not but it is one of the largest changes in the financing of R&D in recent times. The Baker Institute is close to this report and might think of following up on this issue. The report, as you know was chaired by Norman R. Augustine who is a terrific leader who has written a lot about related issues].[2]

EVANS: Yeah, he is.

---

[1] *The Perils of Complacency: America at the Tipping Point in Science and Engineering: An Update to Restoring the Foundation: The Vital Role of Research in Preserving the American Dream* (Cambridge, Massachusetts: American Academy of Arts & Sciences, 2020).

[2] Norman R. Augustine, interview by David J. Caruso, Kenneth M. Evans, and Kirstin R. W. Matthews via Zoom, 22 September and 15 October 2020 (Houston and Philadelphia: Rice University's Baker Institute for Public Policy and the Science History Institute, Oral History Transcript # 1116).

SHAPIRO: [I have not studied this issue carefully but my experience tells me that the rising relative importance of corporate funding of our national research effort is a very significant exchange which needs to be studied more carefully].

EVANS: Well, I have an immediate follow-up question, but I should also say—full disclosure—I was the primary staff on this report.

SHAPIRO: You have . . . you couldn't get a better group of people together.

EVANS: Yeah, Neal [F. Lane] and Norm have really been wonderful, and I learned . . .

SHAPIRO: Norm Augustine's a fantastic person. I mean everybody on this committee's a fantastic person. I know virtually every member of this committee, and I couldn't put together a better committee.

EVANS: Did you overlap? I know that Norm served in some . . . I know he served in later PCASTs but he's also on some subcommittees during Bush 41's PCAST. Did you guys overlap then?

SHAPIRO: I do [not think so]. I know Norm because he was a member of the Board here at Princeton; that's how I got to know him best. He was on the Board for at least four or five years while I was president. That's how I got to know him best, and he taught here [at Princeton] after he retired [from his corporate leadership positions]. He taught in our engineering school for some years—I don't know how many—on a **<T: 150 min>** part-time basis. He came up, I think, a few times a week. But you know, this is a . . . you must have done a lot of work on this. I mean, this report—the thick report—reflects a lot of work and so I'm keeping it to use in my classes. So it has that impact [. . .] whatever that's worth, but I really think we need some new thinking [on some of the issues]. Norm could have written this report ten years ago, and it'd be right; twenty years ago, and it would be right, and now it's right—again still right, so I think, you know, anyone interested in this will benefit from looking at this report, but we need, I think, some new thinking as well.

EVANS: Yeah, I would agree, and I'm not . . . . I know that maybe [Barack] Obama's PCAST tried to, I guess, touch this issue of, you know, government, industry, and university partnerships.

SHAPIRO: Well, that's been around a long time. I mean even I remember serving at the National Academy [on the initial] Government-University-Industry [Research] Roundtable (GUIRR). [I am not sure just what impact it has had].

EVANS: What . . . so what's missing there? I mean, you know, in writing this report, I think . . . I mean, to speak frankly and personally the recommendations ultimately if it's going through a large committee process like this have to be, kind of, more general but, from your perspective as a university president of Princeton and Michigan, what's missing in terms of making stronger, more effective partnerships?

SHAPIRO: What's missing from this report or missing from . . . ?

EVANS: What's—not from the report—but what is . . . sorry, I'm being not specific, but from what can the government do better to encourage, kind of, industry partnerships or encourage . . . but more of those types of . . . a lot of the PCAST . . .

SHAPIRO: I have a very particular view of this, and I don't know at all if it's legitimate or not because I have [not studied the issues carefully enough]. If a corporation has a problem, they will look for the best possible people to answer that problem. They don't care whether they're in Sweden or they're in Kalamazoo, [Michigan]. When they have a problem, they're going to look for the best possible people to answer it because these . . . the problems that they perceive are extremely important to them. So I think that—I know this is not very popular but I'll say it anyway—I think that if you let the universities do what they do best and you let the corporations do what they do best, that's a better strategy than trying to figure out what they can do together because communications [between them will be very imperfect]. Corporations are always looking for talent; they're always looking for ideas. [This is especially the case] for those that are R&D-based in some way, whether it's in the pharmaceutical industry, the chemical industry or whichever industries [have important investments in R&D]. I'm less enthusiastic about "let's get together and we'll do all this together" than I am about letting corporations do what they do best, let the government do what it does best, and let the university do what they do best, and then I believe [rapid] communication will take care of itself. I don't think it's true that communication gets bottled up in universities or it gets bottled up in corporations. The stuff all gets out. So I'm not against communications or against joint projects, which are identified and seem to be very useful to both sides—I'm entirely in favor of that—but I don't think we can engineer that so easily. [At the same time, one has to allow for creative new partnerships that can be experimented with]. **<T: 155 min>** So I'm not against [thoughtful cooperation between these two sectors, but to keep in mind that they are in two different sectors for a reason]. I think the primary focus should be what is it universities do well, and what do corporations do well, and what does government do well, and then go from there. That's just my view. [. . .]

EVANS: Well, yeah, I think. . . well, certainly going against the grain, especially in these committees, seems—to me seems important.

SHAPIRO: How did you enjoy your time on this committee?

EVANS: **W**ell, I learned so much from Neal and Norm. I really enjoyed it.

SHAPIRO: **[**You were lucky to work with two such thoughtful and experienced leaders].

EVANS: And they, you know . . . yeah, it was, kind of, fascinating also to get a picture for how the American Academy works and the all people that are involved in that.

SHAPIRO: [I am glad and not surprised that you had such a good experience].

EVANS: I did, and I think it also has been very, very interesting to watch Neal and Norm work on the Hill and all that they . . .

SHAPIRO: **[**Both Norm and Neal have well-deserved stellar reputations].

EVANS: Yeah, it's been sitting in on these on these meetings with Congress folks and their staff has been really enlightening. . .

SHAPIRO: There's a lesson in here.

EVANS: About what Congress people know personally.

SHAPIRO: Well, [. . .] Norm has a very [distinctive and unusual] background as you know. [As a result he has a well-earned and distinctive reputation across many sectors and a great deal of credibility across many sectors]. He's a very unusual person, [and I am] glad you had a chance to work with him; you [are] very lucky.

EVANS: Yeah, I do feel very lucky, and he's not short on wisdom and he also is very generous with his time and what he passes along. We've, kind of, gotten off the oral history track.

SHAPIRO: I'm sorry.

EVANS: No, it's my fault. I mean, I'm curious and, of course, part of this is that you know all these folks and I'm not sure what your relationships with them [are].

SHAPIRO: Well, [my faulty recollection is that I got to know Neal when he was providing much needed leadership at NSF. And my first serious interaction with Norm was when I convinced him to join the Princeton Board. But over time the common thread was a joint interest in public policy especially in the R&D sector. Both Norm and Neal are well-known and very respected by students of public policy over the last generation. Moreover, I have to repeat the people on the committee you helped staff could not be more distinguished. It is a kind of "who's who" for those interested in public policy with respect to higher education and R&D in the most recent generation].

EVANS: I will say the best comments and the most, kind of, thorough comments we got on them the earliest drafts were Jeanette [Marie] Wing. She was just fantastic, I thought, and really dug into stuff. And then also Steve [Steven] Chu was very responsive.

SHAPIRO: He has an enormous amount of experience in this kind of position. Anyways, lucky you. You're really lucky [to have worked] with such a distinguished group. I'm not going to ask any more questions, make any more statements. I'm keeping you too long on this call.

EVANS: No, no, we're keeping you. Norm is giving a talk with the Baker Institute on Wednesday, so I can send you a . . . the Zoom invite that if you're curious with John [L.] Hennessy at . . .

SHAPIRO: [Yes], I know John. Okay.

EVANS: Well, I will . . . now that we're chatting, I guess, I want to pass it back over to Dave to see if he has any kind of follow-up questions; I know we're kind of running short on time.

CARUSO: I don't have any questions specifically, and you know if you're okay with coming back to talk about some of the reports specifically, then I think if there are any questions that we do think of . . .

SHAPIRO: Okay, you're talking about the PCAST reports?

CARUSO: Yeah. That might be a good . . .

SHAPIRO: I've got to get a hold of them. I think I have them. [. . .]

CARUSO: Sure. <**T: 160 min**>

EVANS: Dr. Shapiro, what I'll do is I'll email you my email so you have it, and as well as this event. That way you can ping me if you have any . . .

SHAPIRO: Yeah, sure. I will do that. Okay, well, I hope I haven't misused your time and, in any case, good luck with this project, and thank you very much.

CARUSO: Thank you.

EVANS: Thank you.

CARUSO: Have a good evening.

SHAPIRO: The most uncomfortable part of these meetings is when you leave it, you just blank everybody out all of the sudden. It's very odd. It's not like when you meet people, and you, sort of, take them through a door or something. Now you're just here and then gone. [laughter] But so apologize I'm going to click the leave part on the screen and please call me back or get in touch with me in any way for anything I can be helpful.

EVANS: Thank you. [. . .]

[END OF AUDIO, FILE 1.1]

[END OF INTERVIEW]

PUBLICATION LIST

SELECTED PUBLICATIONS

"Compensating Balance Requirements: The Theory and Its Implications," Southern Economic Journal, 1964 (with N. Baxter).

"Compensating Balance Requirements: The Results of a Survey," Journal of Finance, 1964 (with N. Baxter).

"The Demand for Money: Further Evidence from the Time Series," Journal of Political Economy, 1964 (with T. Courchene).

"Oligopoly Theory and Retail Food Pricing," Journal of Business, 1964 (with W. Baumol and R. Quandt).

"Distributed Lags, Interest Rate Expectations and the Impact of Monetary Policy," American Economic Review, 1967.

"Banking Structure and the Growth of Non-Bank Financial Intermediaries," National Banking Review, 1967 (with N. Baxter and D. MacFarland).

"The FBR-MIT Econometric Model: Its Special Features," American Economic Review, 1968 (with R. Rasche).

"Consumer Attitudes, Buying Intentions and Expenditures," Canadian Journal of Economics, 1969.

"Econometric Analysis of Policy Choices in an Open Economy," Review of Economics and Statistics, November 1969 (with J. Helliwell, L. Officer, and I. Stewart).

"The Structure of RDX1," Monograph-Bank of Canada Staff Research Study (with J. Helliwell, L. Officer, and I. Stewart).

The Economic Outlook for 1970 - Proceedings of the 17th Annual Conference on the Economic Outlook, The University of Michigan, Ann Arbor, Michigan, 1970 (with S. Hymans). (Ditto: 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, and 1981.)

"DHL-III-A Quarterly Econometric Model of the U.S. Economy," Monograph-Research Seminar in Quantitative Economics, The University of Michigan, Ann Arbor, Michigan, 1970 (with S. Hymans).

"The Choice of Optimal Intermediate Economic Targets," American Economic Review, May 1970 (with R. Holbrook).

"The Efficacy of Monetary and Fiscal Policy-A Comment," Journal of Money, Credit and Banking, 1971.

"Econometric Modeling and the Influence of U.S. Price Movements on Canadian Inflation–A Comment," Inflation-The Canadian Experience, D. Swan and D. Wilton (Eds.).

"Criteria for the Evaluation of Econometric Models," Annals of Economic and Social Measurement, P. 113, 1972 (with P. Dhrymes, et al). Reprinted in a Brookings volume.

"The Index of Consumer Sentiment and Economic Forecasting-A Reappraisal," Human Behavior in Economic Affairs, Essays in Honor of George Katona, Elsevier Scientific Publishing Company, Amsterdam, 1972.

"The Structure of RDX2-a New Model of an Open Economy." Bank of Canada Research Study, 1972 (with J. Helliwell, G. Sparks, and I. Stewart).

"Poverty in Canada-A Bourgeois Economist's View." This forms one chapter in a book on Canadian Economic Problems and Policies, L. Officer and L. Smith (Eds.).

"Monetary and Fiscal Influences on U.S. Money Income-A Comment," Journal of Money, Credit and Banking, 1973.

"Is Verification Possible? The Evaluation of Large Econometric Models," American Journal of Agricultural Economics, June 1973.

"The Allocation of Household Income to Food Consumption," Five Thousand American Families-Patterns of Economic Progress, Institute for Social Research, The University of Michigan, Ann Arbor, Michigan, 1973. A revised and expanded version of this paper is published in the Journal of Econometrics, 1976.

"Macro-Econometric Model Building in Socialist and Non-Socialist Countries-A Comparative Study," presented at the Econometric Society 3rd World Congress, Toronto, Canada, 1975 (with L. Halabuk). Published in the International Economic Review, October 1976.

"Inflation in the United States (1953-1974) An Analysis and Interpretation," in World Inflation, L. Krause and W. Salant (Eds.), Brookings Institution, Washington, D.C., 1977.

"The Structure and Properties of the Michigan Quarterly Econometric Model of the U.S.

Economy," International Economic Review, 1974 (with S. Hymans). Reprinted in Economic Performance, E. Burmeister and L. Kleing (Eds.), University of Pennsylvania Press, 1977.

"The Dynamics of Household Budget Allocation to Food Expenditures," Review of Economics and Statistics, November 1977 (with J. Benus and J. Kmenta).

"Macroeconometric Models of the Soviet Union and Eastern European Economics: A Tabular Survey," Econometrica, November 1977.

Commentary on "The Use of Econometric Methods in the Analysis of Centrally Planned Economics," by Donald W. Green, Journal of Comparative Economics, Volume 1, Number 3, 1977.

"Econometric Review of Alternative Fiscal and Monetary Policies: (1971-1975)," Review of Economies and Statistics, August 1978 (with S. Hymans and A. Hirsch).

"Inflationary Expectations and Consumer Behavior," Business Cycle Analysis: Papers Presented at the 14th CIRET, (Center for International Research on Economic Tendency Surveys) (with F.T. Juster), Conference Proceedings, Lisbon, 1979, pp. 143-186. (Published by Gover Publishing Company Limited, Westmead, Farnborough, Hants, England).

"The Social and Political Challenge of Inflation: An Economist's View" University of Michigan Journal of Law Reform, Volume 14, Number 2, Winter 1981.

"Perspectives on the Forecasting Accuracy of Macro-econometric Models," presented at NSF Conference, Ann Arbor, Michigan, October 1978 (with D. Garmen). Large Scale Macroeconometric Models: Theory and Practice, J. Kmenta and J.B. Ramsey (Eds.), North Holland Publishing Company, Amsterdam, 1981.

"The Privilege and the Responsibility-Some Reflections on the Nature, Function, and Future of Academic Tenure," Academe, November-December 1983.

"Are Schools for Learning?" The Education Digest, December 1983.

"Retooling Colleges for the 21st Century, New York Times, April 15, 1984.

"Is Taking Sides a Good Idea for Universities?" Science, July 6, 1984.

"Paradox, Change and Choice: An Economist's View of Some Current Health Care Resource Issues," The American Journal of Cardiology, Volume 56, August 23, 1985, pp. 3C- 9C.

A Regional Econometric Forecasting System-Major Economic Areas of Michigan with George A. Fulton, The University of Michigan Press, Ann Arbor, Michigan, 1985.

"A National Research Strategy" (Commentary), Issues in Science and Technology, Spring 1986.

Tradition and Change: Perspectives on Education and Public Policy. The University of Michigan Press, Ann Arbor, Michigan, 1987.

"The Purpose of Schools Should Be Learning," The Education Digest, April 1988.

"The Keys to World Leadership: Science, Technology, Economic Growth and Everything," New Jersey Bell Journal, Volume II, Number 2, Summer 1988.

"A Dialogue on Competitiveness," Issues in Science and Technology, Summer 1988 (with Ralph E. Gomory).

"Higher Education in a Changing Environment; Some Scholarly and Economic Imperatives" Higher Education in a Changing Economy, Katherine H. Hanson and Joel W. Myerson (Eds.), MacMillan, New York 1990.

"Reflections on the Future of University-Based Research," Educational Record, Spring 1990.

"The Willingness to Risk Failure," Science, Volume 250, Number 4981, November 2, 1990.

"The Research University and the Economy," Queen's Quarterly, Volume 98, Number 3, Fall 1991. Also The Bridge, Volume 22, Number 3, Fall 1992.

"Balancing a Portfolio of Civic Responsibilities: The Research University," A Higher Education Map for the 1990s, Gene A. Budig (Ed.), American Council on Education/Macmillan Series on Higher Education, Spring 1992.

"The Functions and Resources of the American University of the Twenty-First Century," Minerva, Volume 30, Number 2, Summer 1992.

"Notes on the American University in a Changing World," The Universities of the Future: Roles in the Changing World Order, presented at The First Richard A. Harvill Conference on Higher Education, The University of Arizona, November 1992.

"Current Realities and Future Prospects," Academe, Volume 78, Number 7, January/February 1993.

Employment and Health Benefits: A Connection at Risk, Institute of Medicine, Marilyn J. Field and Harold T. Shapiro (Eds.), National Academy Press, Washington, D.C., 1993.

"Universities in Higher Education: Some Problems and Challenges in a Changing World," Policy Frameworks for a Knowledge Economy, T. Courchene (Ed.), (with Bernard J. Shapiro), John Deutsch Institute for the Study of Economic Policy, Queen's University, Kingston, Ontario, October 1994.

"The New University? The New Liberal Education?" Changing in a World of Change, The University of Michigan, October 1995.

"New Opportunities and New Constraints-Developing Tension in American Higher Education," New Horizons in Research and Higher Education: Trends, Constraints, and Opportunities, Second Public GAAC Symposium, National Academy Press, Washington, D.C., 1996.

"Cognition, Character, and Culture in Undergraduate Education: Rhetoric and Reality," The American University, National Treasure or Endangered Species? Ronald G. Ehrenberg (Ed.), Cornell University Press, 1997.

"University Presidents-Then and Now," Universities and Their Leadership, William G. Bowen and Harold T. Shapiro (Eds.), Princeton University Press, 1998.

"Sistemas Éticos y Políticas Públicas: La Clonación de Seres Humanos. Un Ejercicio de Noventa Días Sobre la Ética Práctica y Profesional (Ethical Considerations and Public Policy. A Ninety Day Exercise in Practical and Professional Ethics: Cloning Human Beings), En las Fronteras de la Vida: Ciencia y Ética de la Clonación, presented at the Instituto De Bioetica Conference in Madrid, Spain, January 16, 1998.

"Stopping Science: Human Cloning-Should It Be Stopped?" Health Matrix: Journal of Law-Medicine, Volume 9, Number 2, Summer 1999, presented at the "Stopping Science" workshop, Case Western Reserve University, September 25, 1998.

"Ethical Considerations and Public Policy. A Ninety Day Exercise in Practical and Professional Ethics: Cloning Human Beings," Science and Engineering Ethics, Volume 5, Issue 1, January 1999.

"Liberal Education, Moral Education," Princeton Alumni Weekly, January 27, 1999.

"The Genetic Revolution and Human Rights: The Oxford Amnesty Lectures 1998," Justine Burley (Ed.), Nature Biotechnology, Volume 17, April 1999.

"Almost Persuaded: Reactions to Oldham et al," Archives of General Psychiatry, Volume 56, August 1999 (with J.F. Childress).

"Reflections on the Interface of Bioethics, Public Policy and Science" Kennedy Institute of Ethics Journal, Volume 9, Number 3, The Johns Hopkins University Press, September 1999.

"Ethical Dilemmas and Stem Cell Research," Science, Volume 285, Number 5436, September 1999.

Review of "Germ-Line Intervention and our Responsibilities to Future Generations", The New England Journal of Medicine, December 23, 1999.

Review of "The Second Creation: Dolly and the Age of Biological Control" in New Scientist, March 18, 2000.

"Federal Policy Making for Biotechnology, Executive Branch, National Bioethics Advisory Commission," Encyclopedia of Ethical, Legal, and Policy Issues in Biotechnology, Thomas J. Murray and Maxwell J. Mehlman (Eds.), John Wiley & Sons, Inc. 2000.

"Reflections on the Interface of Bioethics, Public Policy, and Science," The Cloning Sourcebook, Arlene Judith Klotzko (Ed.), Oxford University Press, 2001.

"Ethical Issues in the Designing and Conduct of Clinical Trials in Developing Countries," The New England Journal of Medicine, Meslin, E. M. (co-author), 345:139-142, 2001.

A Larger Sense of Purpose: Higher Education and Society, Shapiro, Harold T., Princeton University Press, 2005.

Belmont Revisited, Ethical Principles for Research with Human Subjects, James F. Childress, Eric M. Meslin, and Harold T. Shapiro, Editors, Georgetown University Press, 2005.

"The Hamantash and the Foundation of Civilization: or, the Edible Triangle, the Oedipal Triangle, and the Interpretation of History," The Great Latke – Hamantash Debate, Ruth Freedman Cernea, Editor, University of Chicago Press, 2005.