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University of California
Berkeley, California

George S. Tolley

George S. Tolley: From Agricultural to Resource, Urban, and Health Economics at the University of Chicago

Economist Life Stories

Interviews conducted by
Paul Burnett
in 2018

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George S. Tolley, 2020
Courtesy of G.S. Tolley

Abstract

George S. Tolley is Professor Emeritus of the University of Chicago Department of Economics. A graduate of American University and the University of Chicago, Tolley trained in agricultural economics and cultivated an early interest in the economics of resource management, a precursor to resources and environmental economics. From 1955 to 1964, he was a professor at North Carolina State University. In 1964, he was the Director of the Economic Development Division of the Economic Research Service of the US Department of Agriculture, and in 1974–75, he served as Deputy Assistant Secretary in the Office of Tax Analysis of the US Department of the Treasury. He has also consulted widely for federal, state, and municipal agencies on the problems of urban and environmental economics from the 1960s until the present day, both as an academic and in his capacity as CEO of his firm RCF Consulting, Inc. From 1964 to 2000, he was professor of economics at the University of Chicago, where, among many contributions to agricultural economics and a signal contribution to the quantity theory of money, he developed the formal concept of amenities in urban economics and provided a framework for advancing the field of health economics. Tolley is also known as a prolific mentor, ushering into the field a large number of economists, many of whom also rose to prominence in public service and the service of international financial institutions.

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Project history

The impact of economics in our society is hard to overstate. Economics structures government policy, guides decision-making in firms both small and large, and indirectly shapes the larger political discourses in our society.

To enrich the understanding of the influence and sources of powerful economic ideas, the Becker Friedman Institute for Research in Economics at the University of Chicago set out in 2015 to capture oral histories of selected economists associated with Chicago economics. The aim was to preserve the experiences, views, and voices of influential economists and to document the historical origins of important economic ideas for the benefit of researchers, educators, and the broader public. This oral history with George S. Tolley, conducted in nine sessions in Chicago, Illinois in 2018 from January to June, is the fourth interview for the project.

Economist Life Stories is more than a collection of life histories; it chronicles the history of a scholarly community and institutions at the University of Chicago, such as the Graduate School of Business, the Cowles Commission, and the Department of Economics. It also reflects the achievements of faculty and students in the domains of economic policy-making and private enterprise around the world. Although this project focuses on the leaders and students of the University of Chicago Department of Economics, Graduate School of Business, and Law School, we hope to add more stories from economists around the world as the project expands.

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Interview 1: January 29, 2018

Burnett: This is Paul Burnett interviewing Dr. George Tolley for the Economist Life Stories project. It is January 29, 2018, and we're here in Hyde Park, Chicago. Dr. Tolley, welcome.

01-00:00:40
Tolley: Well, glad to be here. Glad you're here.

Burnett: So in oral histories, we normally start at the beginning. We talk about where folks were born and any family ancestry and things like that. But there's a lot of family history that's directly relevant to your career. So I'm wondering if we can start by talking a little bit about where you were born, and about your parents and grandparents.

01-00:01:18
Tolley: Okay. Well, I was born in Washington, D.C. My father [Howard R. Tolley] was, at that time, a civil servant, working in the Department of Agriculture, and some of this is relevant to my own history. So for what it's worth, I was born where the Supreme Court Building now stands, which is not relevant to anything.

Burnett: What year were you born?

01-00:01:53
Tolley: 1925. I lived in Washington, D.C. till I was four years old. Let's see. My father majored in mathematics at the University of Indiana, Bloomington. Then he went to Michigan City Indiana, not all that far from here, and taught high school for a year. He apparently decided that was not for him, so he got a job in the Coast and Geodetic Survey. That's where they go out and measure the height of everything. He went to Washington, D.C. to do that. This was about 1915 or something like that. Then he worked for someone named, as I recall, William Jasper Spillman. He did that for two or three years. Then World War I came along. He couldn't fight in World War I because of some kind of arm injury.

01-00:03:32
Tolley: World War I brought prosperity to US agriculture, because of declines in European production. In the US, they plowed up places like the Great Plains and Montana. US agricultural capacity became greater than could be supported by a world peacetime economy. A big agricultural depression ensued. People said, "We've solved the physical problems of agriculture through the land grant colleges started in the 19th century; now there are these economic problems and we're we going to turn our attention to that." So as I understand it—and I don't really know the details of this at all—but Prof Spillman was brought over to the US Department of Agriculture and they started economics research at that time, and Prof Spillman took my father with him, among other people. So during the 1920s, my father was working in the

Department of Agriculture, and they were originating a lot of modern-day agricultural economics that involved supply and demand and that kind of thing, to bear on it, and statistical techniques and so forth. So there's a whole history there.

Burnett: Can I stop you there for a moment—

01-00:05:40
Tolley: Sure.

Burnett: —and go back even further? Do you know about your grandparents? Is there an agrarian background in the family on either side?

01-00:05:55
Tolley: Yes, let's see. My father's father actually was an insurance salesman. I'm not sure they were farmers, but there may have been some far background there. My father's mother was a schoolteacher. So then my mother's family had a farm background. They're from Indiana. My mother's father, he was one of six children. He wanted to be a musician and he couldn't stand farming. So he gave up farming and went to this town, went to Marion and invested all his money in an interurban thing that went bankrupt.

Burnett: An interurban thing?

01-00:07:04
Tolley: Interurban. They had these interurban trains between—.

Burnett: Okay.

01-00:07:10
Tolley: It was a very common thing. When you go out in the suburbs today there, they have remnants of them. So anyhow, that went bankrupt or another company started building right alongside of them. They had a very rough life. However, my uncle became quite a famous musician. He helped Paul Whiteman start his orchestra.

Burnett: Really?

01-00:07:39
Tolley: In a recording of *Rhapsody in Blue*, he plays the opening clarinet.

Burnett: Wow!

01-00:07:48
Tolley: So anyhow, he had his career at Radio City. My mother, she was one of five siblings. I think my father was one of maybe four siblings, two boys and two girls. Then my uncle, my father's brother, he became social secretary in the White House. He was the penman. They came out of Indiana, and we would go back there to a farm every summer.

Burnett: Right. So this is Midwestern farming, export agriculture, growing corn and—?

01-00:08:40
Tolley: It must've been corn, right, yeah.

Burnett: It must've been, yeah, in that range, subject to all of the ups and downs of farming life, the international markets. It could be a fairly good living, and it was, as you said, up until World War I. Did your father ever talk about what it meant to him to do the kind of work he was doing? What was an agricultural economist in those days? What was the purpose behind it?

01-00:09:24
Tolley: Well, they were developing a lot of tools of analysis to understand the prices and quantities of these commodities. Of course, just following up, we used to go back to Indiana every summer. This is a little later, in the thirties. We were out there in the drought conditions, which were really horrible. I remember seeing that as a kid.

Burnett: What did it look like?

01-00:09:57
Tolley: Well, it was all parched. It was terrible.

Burnett: Yeah. Was it almost desert conditions in some cases? Just kind of sandy, cracked earth?

01-00:10:05
Tolley: Well, it was that, plus there would be cornstalks, but they weren't bearing anything. The people were not living well, let's put it that way.

Burnett: Right.

01-00:10:19
Tolley: No, my father never talked that much about it. As I say, his family was not a farm family. They may have been on a farm for a while, but they were not primarily farmers. In the twenties, in the US Department of Agriculture, the Bureau of Agricultural Economics started, which is a very central thing in the history of it, as you probably know from your own work, and he was very much involved in that. They had the graduate school in the Department of Agriculture. It was a night school. My father taught statistics there. There was somebody in the back of the room who never said anything. His name turned out to be Mordecai Ezekiel. My father brought him into the Department of Agriculture. He became quite famous in his own right.

Burnett: Oh, yeah, absolutely. So he had taught him in the graduate school at the USDA.

01-00:11:41
Tolley: Right.

Burnett: There was a dream at that point, I think, that what they were lacking was information, and if they could get enough data and if they could get the right kind of information, and if they could get that information into the hands of farmers— They were idealistic, as far as I understand it from the history and reading what they were writing at the time, that if they could get men of good will together that they could solve this [farm problem]. Because there was an antagonism. That agricultural depression was really dramatic. We always talk about the Great Depression in 1929 and so on, which was a worldwide phenomenon, and it was the entire economy. But after World War I, there was a tremendous collapse in [commodity] prices. There was no way, no easy way, to support farmers because they were exposed on the world market, as I understand it. So whole social movements grew up around fixing that problem. The nascent farm organizations were saying, "Look, we had a good life before World War I. We were making enough to feed our families, and we were making enough to purchase the products that we needed from the cities. And we were getting a good price. So we want a policy that will give us that price, that 'good price' that we had before the war." I think the economists, such as your father, were really struggling with that demand to do so in an economic way, and a whole bunch of plans were hatched around that, some of which were less economically sound than others. So it must've been a heady time for your father and his colleagues. They were coming up with great ideas, but they were dealing with a lot of political pressure. So I can imagine that that was a struggle.

01-00:13:59

Tolley: Yes, well, let's see. There were various parts of this. Many of the people my father associated with were from Wisconsin, and they were the so-called institutionalists. He was not. He didn't go to Wisconsin, although we lived next door to M. L. Wilson.

Burnett: You lived next door?

01-00:14:22

Tolley: Yeah, we were very good friends, our families. But there were various parts of this. My father was much less ideological than these other people. There were parts of this analysis that were sociological, and then there were other parts based on the idea that all you needed was education. I think my father was frankly a little bit more hard-headed. He said, "We need to understand why these prices go up and down and why there's overplanting in some cases." So there was a great deal of important technical analysis developed. Actually, some of the beginning of modern-day econometrics was actually back there in the twenties, in the US Department of Agriculture. That was more the part that my father was interested in. But this Bureau of Agricultural Economics had sociologists and it had other people on it.

Burnett: Can you talk a little bit about how it is an antecedent or an early example of econometrics? And kind of define what econometrics is, as opposed to other forms of analysis.

01-00:15:50
Tolley: Well, let's see. An explanation that comes to mind is based on an example. You have the yield of cotton, and it varies a lot. Then they try to explain that. If you don't have any hard analysis, you just kind of free-associate about it. Then there is R. A. [Ronald Aylmer] Fisher and these probability people. Actually, a lot of this developed in the—this was not economics as such—Land Grant Colleges. After the Civil War, every state had a Land Grant College, and most of them—maybe all of them—had experiment stations. They would plant experimental fields and see how they would do, so they were collecting a lot of statistical information and tried to learn how to analyze it in a systematic way. But then you have the total yield of cotton, the total production of cotton. That's the so-called dependent variable. Why did the output of cotton go up this much in some years and go down in other years? You have a scatter plot, so-called. Then you apply statistical techniques to it and you try to say, what are the variables that caused this? You put those in as independent variables. So then you come to a regression analysis, where you're regressing the yield of cotton or the production of cotton, something like that, on income and weather and things like that. There you have an econometric equation. That was all really started back there in the US Department of Agriculture. They had their ups and downs. There was the story about Mordecai Ezekiel. He went over to testify before Congress, and he was explaining the kinds of things that he was doing. One of the congressmen said, "Now, Mr. Ezekiel, what is the color of the blossom on the cotton plant?" Of course, he didn't have any reason to know that. So that was an example of the kind of hostility toward some of these things they were doing.

Burnett: Was there a question of legitimacy between those statisticians and economists who were from the city, who did not necessarily have a background in farming, and those who had come from the Midwest, for example, had come from farming families? Did they have more credibility, when it came to congressmen who come from farming districts?

01-00:18:56
Tolley: Probably.

Burnett: Yeah. I think that that is some of the tension, because getting into the 1930s, with the government programs, there were these "city economists" like Rexford Tugwell and folks who were considered to be less— They were not from around the farming districts, and they were considered to be kind of interlopers, to some degree.

01-00:19:25
Tolley: Well, they were not even accepted within the Department of Agriculture, there was tension. Reading Jess Gilbert's book on all this, there was Tugwell, but

his whole crew. Actually, [Henry A.] Wallace did not support them. They left the administration after a while. But let's see, where are we?

Burnett: Well, we were talking about the importance of sophisticated statistical techniques to do analysis of what had become known as the farm problem. I think it's true that a lot of this comes out of statistical tools that were developed to understand the biological side of agriculture. It comes out of population sciences to understand human populations, as well. Going back to Karl Pearson and then up into R. A. Fisher—at a certain point, as I recall— I know a little bit about Theodore Schultz, T.W. Schultz. In his early career at Iowa State College, he brought in R. A. Fisher, in the thirties, to Iowa State to beef up their agricultural statistics and their statistical laboratory, which was established by Henry Wallace. So he was doing that in the twenties. He was really making the science of agricultural economics rigorous, and I think there was a tremendous emphasis on that—but all in this context of politics, right? It was a political problem. What do we do about the low price of agricultural export products?

01-00:21:30
Tolley: Well, I would say yes and no there. Certainly, that was the motivation for it. But I don't think that all of the people, and not even most of the people, within the Department of Agriculture were all that concerned with it. They just were more like university or social science people. They just wanted to know what was going on. And that's certainly what my father was doing. I don't know how he met him, but he became very good friends with Henry Wallace. That's who my father ended up back in the New Deal eventually. But they were all of that ilk, if you will.

01-00:22:13
Tolley: But as far as within the Department of Agriculture, particularly in the twenties—there were a lot of people who had the view of what you're talking about—but I would not say that that was what was bringing people to work every day. They were just coming to work to understand what was going on.

Burnett: They understood themselves to be scientists.

01-00:22:38
Tolley: Yes, right.

Burnett: They wanted to understand, this is a natural science problem of the oversupply of what is, in essence, a biological product. How can that be understood, *in order* to remedy it? They're not at the remedy stage in their understanding. They want to simply understand the scope of the problem.

01-00:23:03
Tolley: Right.

Burnett: So there were ideological folks. I think Mordecai Ezekiel wrote a good chunk of the Agricultural Adjustment Act in '33. There had been a—

01-00:23:18
Tolley: I'm not sure that Mordecai Ezekiel did that. He was more a pure econometrician. I think the lawyers wrote that act, actually?

Burnett: So there's the act and there's a justification for the act, which is a small pamphlet. I apologize; that's what I'm referring to. And I believe that he wrote that. So this is 1933. Before that, Herbert Hoover had a kind of farm program—that was the Farm Board—that was to make grain purchases to prop up the price. And it didn't go anywhere because it was voluntary. So there were a lot of free-rider problems associated with it. The 1933 program, it had to do with restricting the supply of agricultural products, so that it would drive the price up. There was a system to get farmers—to require farmers—if they wanted to participate, to pull land out of production; and ideally, that would drive up the price. The justification for it in this pamphlet in 1933 was to give "economic justice" to the farmer. So there is that ideological side to it; there was a response to the complaints of farmers that had that 'we have been exposed to the international market, when the industrial side of the economy has been protected by tariffs.' So there was this real pressure to make the tariff effective for agriculture. This was one way that the economists who designed that program felt was the least injurious to the agricultural economy. But in addition to the data gathering and the scientific research, they were in this political cauldron around making a policy that would please sectors of the economy, the agricultural sector of the economy. So they were somewhat caught in that, to some degree, weren't they?

01-00:25:52
Tolley: Well, yes, but I want to say this. My father, though he was intimate—. We're getting way ahead of the story here.

Burnett: Sure, sure.

01-00:26:01
Tolley: But my father was not an ideologue; he was a very effective administrator, and he, in the end, was responsible for a lot of these programs that you're speaking about. But he was not a Henry Wallace or anybody; he did not go out and make speeches. He was not even as much of an idealist, probably, as M. L. Wilson. They were close friends. But let's go back. This was in the twenties.

Burnett: Sure. Yeah.

01-00:26:30
Tolley: I think my father was just, should I say, a workaday civil servant. He described to me he would go out and work with farmers. It was still very hands-on. But that went on until 1930. Then they started the Giannini

Foundation [of Agricultural Economics] at the Berkeley campus, and he was invited to be the first director of that. So I was four years old at that time, and we moved to California. I spent the years from four to seven in Berkeley, as a Berkeley kid, really. As I was saying, my father was a good friend of Henry Wallace. Henry Wallace was calling him on the phone all the time. Finally, he said, "Well, Howard, won't you come back to Washington for a year?" In 1933, then, we moved to Washington. We were there for about three years, and then my father said, "No, my leave is up, I've really got to go back." So we went back to—this was probably in '36 or '37, I don't know exactly—we went back to Berkeley for a year. Then one day Henry Wallace called and said, "No, I really have to have you." So we moved back to Washington and never went back. I don't know whether we intended to or not. But it was those turbulent years after 1933. My father went back into the— It was the Three-A, the Agricultural Adjustment Act. That was the act where they restricted production in various ways. My father was very active in that. Then was there George [N.] Peek? He was the administrator.

Burnett: That's right.

01-00:28:32
Tolley: Anyhow, at some point he left, and my father became administrator of the Three-A and was very responsible for all of that. Very close to Henry Wallace. They went over and watched—was it the '36 election? Anyhow, my father went to Henry Wallace's home and they watched the returns together. Then I'm saying that partly because a few years later, a great distance developed between them, when Henry Wallace became interested in running for president and he changed. That's my father's story; it's not my story.

Burnett: Yeah.

01-00:29:21
Tolley: So I was around. We were living in various places around Washington. We lived in Chevy Chase for a while. That's when we lived next to M. L. Wilson's. When was that? Then we moved to Georgetown, which was an interesting experience in itself, because I went to public schools. For instance, the Wilsons sent their kids to Sidwell Friends School, which is—.

Burnett: The Quakers.

01-00:29:54
Tolley: Yeah. Friends School. I don't want to say it's the snob school. Anyhow, my parents said, "No, we're going to send our children to public schools." So I went to public schools in Georgetown. That was important because they were city situations, and there were a lot of lower-income people. I got exposed to a lot of people that in Chevy Chase I never would've, and in Berkeley, I never would have. So that was part of it.

Burnett: Well, so in Georgetown, which is now a very fancy place, right? So in those days, were there working-class populations? Were there folks who were down and out? Did you see folks of different backgrounds?

01-00:30:51
Tolley: All of that. I think Eleanor Roosevelt had moved over there. One thing they said, "Have you heard the whites are driving the blacks out of Georgetown?" Which they were doing. We certainly—the blacks were one block away from us and so forth. But they were not in the schools, which were separated.

Burnett: Right.

01-00:31:14
Tolley: There's something called Foggy Bottom. It's where the World Bank is and so forth. But that was a low-income white situation, and those were the kids from the lower classes. I got exposed to that kind of element. For what it's worth—this is a little bit unrelated—I remember that I was sitting in Lafayette Park with my mother, right across from the White House, and this little black kid came along and started getting garbage out of the trashcan right next to us. So this made me even more of a staunch New Dealer and so forth.

Burnett: So you saw the inequality.

01-00:32:09
Tolley: Yeah, right.

Burnett: You saw some of the racial inequality and structural inequality as a young—How old were you then?

01-00:32:20
Tolley: Oh, eight or nine, something like that, at that time.

Burnett: You had that exposure and that had an impact on you.

01-00:32:27
Tolley: Yes. So I was not a farm boy. And that's relevant to my career decisions, in a way. But anyhow, so that was a part of my childhood. I knew there was John D. Black; he was at Harvard. I knew most of these people in the agricultural New Deal. I'd see them all. There would be parties where kids would be, and so I saw them. And I saw a rough side. My father would go to congress and get chewed up and he would have a terrible time in the whole—

Burnett: I have read those transcripts. It's incredible. And it's striking because there was Congressman [Malcolm C.] Tarver from Georgia, who was always after him, it seemed. There's this one passage where you can tell that Tarver's trying to trip him up and say, "Are you trying to make these programs so that they're fairer to the farmers?" Your father said, "I don't know about fair. We don't design these programs for fairness. I think it's helped farmers." But it was this back and forth: I want to get you to say something, so then I can put the

screws to you. There's no audio, but you can tell that he [Tolley] is trying to defend his position as a civil servant. His ideal is that this is my job to do this. I don't have an agenda; I'm not trying to do something; I'm not trying to pull something on someone. But he was in this political realm where people were upset about government policies, and he was in charge, right? He was in charge of the Triple-A and he was head of the Bureau of Agricultural Economics from 1938 until you were in college. So your formative years, your father experienced this and you were growing up in that environment. One of the things, a question I have, I suppose, is— I would not think that given that experience, you'd want your son to go into the family business. So here you are. At what point do you see yourself studying economics? Does that happen? Let's take it at high school. What were you interested in, in say, high school?

01-00:35:46
Tolley: I was not interested in my career at that point. I know some people are. What was I doing in high school? Probably having an interesting time.

Burnett: Right. Yes, yes.

01-00:35:59
Tolley: I would say, though, actually what I was doing in high school—. A couple of summers, my father would set me up at a desk in his outer office he had. There were, oh, two or three secretaries out there; there was him; and then there were other high officials of the BAE [Bureau of Agricultural Economics]. So I spent a couple of summers there. I certainly learned a lot about the nitty-gritty of what goes on. I saw how my father could be decisive when he needed to be, and it was very instructive that way. So I learned a lot. I was not ideological at all, at that point; I was just learning. I think my father had—I'm the youngest of three boys, and I was the only one who showed a real spark, I think, for this kind of thing. So I learned so much from father. He taught me the Pythagorean Theorem and so forth. So anyhow, I spent those summers there. This gets ahead of the story. Let's come to this later, because it's important.

Burnett: Sure.

01-00:37:20
Tolley: Well, we got to California and back.

Burnett: Then you were back in Washington, and you were growing up in Georgetown, and you were in Foggy Bottom for a while.

01-00:37:35
Tolley: Well, I was not in Foggy Bottom. I went to Western High School. It was the second-best high school in the country or something like that. But it drew from a large area, and it drew kids from Kalorama Road, which is where the Obamas are now living and so forth, a higher-income situation. Then there

was Georgetown, which was mixed in itself; and then there was Foggy Bottom. That was where there was, at that time, a low-income population.

Burnett: But you were attending high school and your father responded to your interest in what he was doing. You would spend time in his office. For a young boy becoming a man, this is an exciting environment. I think to this day, the USDA is not a boring place, when it comes to putting together a farm bill or something; they're burning the midnight oil. It's an action environment.

01-00:38:48
Tolley: Right.

Burnett: So I can imagine that that was inspiring for you, and your father responded by taking the time to talk to you about science, to get you excited about learning. I think that that's an important feature of parenting these days, working with your children to channel their natural curiosity. But you took to it more than your brothers. Can you talk about your brothers? They're older than you or—?

01-00:39:25
Tolley: They are, that's right. All three of us became economists. Incidentally, talking about career, I think till rather late in the stage, I thought I would be a civil servant. I thought that was my destiny. I thought I would go to college, and then when I was through with that, I really kept on going to college because I didn't want to go to work. [they laugh]

[Read more on George Tolley's childhood in the Appendix.]

Burnett: Well, so what was it about civil service? Because when you say the words 'civil servant,' it can have a negative connotation for some people. They think of it as bureaucratic. Tell me what civil service meant to you.

01-00:40:17
Tolley: Well, I'll tell you what it meant to me and still does mean to me, that is, to bring the best analytic ability you can. Governmental affairs are very complicated. So I think I've devoted a lot of my career, my academic career, to training people who will go work in the government, and improve things by making better decisions. That's kind of where I came out, I guess, that I wanted to do. I did not want to go through the wringer that my father did. I don't say that very often, but it's the truth.

Burnett: Well, I can't say that I blame you. It was a wringer.

01-00:41:02
Tolley: Right.

Burnett: Absolutely. So you learned a couple of things. You learned that civil service, in its ideal form, is a noble thing to do, but it comes at a cost.

01-00:41:14
Tolley: Yes. Well, it can. There are certain places— I was in the [Department of the] Treasury later. If you get in the right place, you can do very high-level work. You get to other places and they're dead ends, of course, and all of that. In my childhood, I was always going to be a journalist, until the very last minute. I put out a neighborhood newspaper. I think I put out two of those. Then I edited the junior high school paper and the high school and college paper, so I was absolutely fascinated by journalism. That was a part of my childhood.

Burnett: What was fascinating about it for you?

01-00:42:00
Tolley: It was exciting, I guess. I don't know.

Burnett: There was a romance to it. There is to this day, a romance to journalism, even though there's lots of denigration of it as a profession these days. But a search for truth, getting into the action of what's going on, what's happening, and reporting that to others. So it has that appeal. So another piece of this history is World War II. So you're sixteen, right?

01-00:42:46
Tolley: Let's see. I graduated from—

Burnett: In '41?

01-00:42:50
Tolley: Around '41. I graduated when World War II had started. That's basically why I went to American University. I'd graduated midyear and I was going right into college, so I had to choose a place around Washington. I remember spending that weekend "Should I go to Georgetown, American U or UW or Catholic U?" and so forth. I finally chose American University, and I'm very glad I did. I think the liberal arts education is very important; it broadened me in a way that I'm very thankful for. So anyhow, I started at the college there. I edited that paper while I was there. Then I went into the Army.

Burnett: What year was that?

01-00:43:45
Tolley: It must've been '44. I went in the Army. I went into infantry basic training. At the end of thirteen weeks, three o'clock in the morning, we came up off of a bivouac and they called out three people. They said, "You're shipping out tomorrow." So they sent three of us to college. I went to Penn State University. All the others went and fought in the Battle of the Bulge, so that was '44, I think.

Burnett: Right. That's right.

01-00:44:37
Tolley: So anyhow, then I was sitting up there at the state college reading about the Battle of the Bulge and feeling very strange about the whole thing.

Burnett: I bet. So what was the activity that you were doing at Penn State?

01-00:44:53
Tolley: I was studying engineering. I studied a year of engineering, most of it in electrical engineering. Well, it was important. I studied. I learned my calculus there, which I'm still using. When I was at American University in liberal arts, I took a math exam one day, four questions, no correct answer. But I got the principle, so I got an A. Then I went to the ASTP, the Army Specialized Training Program, studied engineering. You have two questions on an exam. Unless you get them both right, you go to the infantry.

Burnett: Wow. No pressure there.

01-00:45:53
Tolley: I learned to get the right answer.

Burnett: Yeah. That's an added pressure.

01-00:46:01
Tolley: So somewhere in that year, there was a course. There was USAFI, United States Armed Forces Institute. I took a correspondence course in economics from—Kenneth Boulding was the teacher.

Burnett: Wow.

01-00:46:20
Tolley: I did that and I did rather well at it. Anyhow, then I got out of the Army and went back to finish up at American University. I majored in economics. It was along at that point that I decided I was not going to be a journalist after all, because it was too superficial. You never had time to really dig into anything. So I decided to become an economist. Then I finished up at American University, still editing the paper most of the time. Then while I had been in the Army—I guess I got out of Penn State and was in Camp Crowder, Missouri for a while. At that time, then I went up to the University of Chicago. I had a friend there from high school. So I went there to visit the University of Chicago. I liked it, actually.

Burnett: This was in '47?

01-00:47:50
Tolley: No. It would be in '44 or '45.

Burnett: Oh, okay, that early.

01-00:47:55
Tolley: I was in the Army only a couple of years, I think.

Burnett: Okay.

01-00:48:00
Tolley: So in any case, then I was deciding where to go. Yeah, I was graduating from American University—that must've been '46, '47—and I was deciding—. I didn't want to go to work yet. I felt I wanted to go on to school. So I thought, okay, I'll go get a master's degree somewhere, and I'll come back and work in the government. Then where should I go to graduate school? I rejected the Ivy League. I still do that. I didn't want to be a Harvard esthete. I didn't like that.

Burnett: Okay. And that's why? You felt like it was kind of snooty?

01-00:48:52
Tolley: I guess I felt that way; I'm not quite sure. It was kind of instinctual. But I felt I liked the rough-and-tumble of Chicago. I still feel that I made the right decision in doing that.

Burnett: Can you say a bit more about the "rough-and-tumble?" What does that mean? Or can you think of an example of how it's different, say, from the Ivies?

01-00:49:21
Tolley: Well, later it becomes more and more clear. I don't know if you're aware of it; the Chicago tradition is "anything goes." You just tear into your opponent and you think anything. You don't bother about being proper. It's that kind of thing.

Burnett: Freedom.

01-00:49:43
Tolley: Yes, right.

Burnett: Intellectual freedom.

01-00:49:45
Tolley: Yes. As I say, there's something rough-and-tumble about it. So anyhow, so I feel I made the right decision to go to Chicago. But of course, I went to Chicago and I never came back.

Burnett: That's right. You did stick with that, didn't you? Before we leave American University, it was a bachelor of arts, and you ranged widely. You studied English, you took history. Is that what your undergraduate experience was like?

01-00:50:17
Tolley: Well, I guess actually, for some reason, it was—. Well, I have a bachelor of science from American University.

Burnett: Ah.

01-00:50:25
Tolley: I actually started out in math and physics, but I had a full liberal arts education.

Burnett: Okay. And liberal arts, especially in American schools, it does entail a lot of science, right? So it's about—.

01-00:50:41
Tolley: Right, that's right.

Burnett: Yeah. So you chose economics at that time, by contrast with, say, journalism, because it afforded you the intellectual stimulation and quiet, or steadiness, to pursue deep problems. Is that right?

01-00:51:06
Tolley: Well, I think that's right, yes.

Burnett: Yeah. I've spoken with others of your generation, and I think one aspect of that time is that economics was a natural choice for a young person in school, because of what was going on around you. You had economic tumult everywhere you looked. There was the Great Depression, there was all of this uncertainty, and people wanted answers. Why do we have a powerful industrial economy that's on its knees, during the Depression? Why are so many people out of work? Is that part of the stimulus for you? Or is there also a fact that your own father was at this high level in government and doing all of this important work? Was that a stimulus for you, to follow in his footsteps to some degree?

01-00:52:06
Tolley: Well, maybe part of it. I think it's even simpler. We had been through this awful depression. I was going to devote my life to make sure it didn't happen again. That was the overriding— if I want to do something useful, that's what I should do.

Burnett: Right, to avoid or prevent that from happening—

01-00:52:27
Tolley: Right, right.

Burnett: —by understanding the problem. And it was a question, right? It wasn't a settled. There were emerging economic theories that had become very popular—speaking of the Ivy Leagues and proper understandings of things. So what had taken root at Harvard and other places was a kind of American version of [John Maynard] Keynesian explanations for things. So Keynes' general theory of money is taught as a kind of new orthodoxy. Were you exposed to that? Did you talk economics with your father?

01-00:53:18
Tolley: So we'll come to all of what you're saying a little later, I think.

Burnett: Okay.

01-00:53:24
Tolley: But my father was very good; he did not try to influence me in any big way, or even in a small way. He was very balanced, even though when he was head of the BAE, which was heading what Jess Gilbert said was the Third New Deal and so forth. All of his associates were Wisconsin institutionalists. He was not; but as Jess says, he was very friendly to them and he supported them, and the BAE really was about that. But what's the question?

Burnett: Well, I can actually maybe get there by following up on something you just said. So, the Wisconsinite Institutionalists. Institutional economics emerges more or less out of the University of Wisconsin, and there are these leading figures in it at the end of the nineteenth century—Richard Ely and Thorstein Veblen and John. R. Commons. It's an American body of economic thought that has to do with understanding the way in which institutions structure our society, structure our markets. There's a meliorism to it, an idea that capitalism in the late nineteenth century is up and down, it's boom and bust, and we can order our society differently, in order to deal with questions of distribution and inequality. That's a very rough description of institutional economics, but the basic idea is that you don't leave things alone; you understand society as something that can be engineered. Is that a fair description of that approach?

01-00:55:37
Tolley: Well, in a way, I'm not the one to ask. I am not an institutional economist.

Burnett: But you knew enough to know that that's not what you liked, let's put it that way.

01-00:55:56
Tolley: Well, how did we get into this?

Burnett: So we were talking about your father. He did not try to influence you. He approached things in a balanced manner, unlike the other people in the Bureau of Agricultural Economics, who came from, as you said, an institutionalist framework, where it was not understanding the way things are; it's looking at the world and saying, "this ought to be something else." So values are part of economics. That, I think, is a strong element of institutional economics, unless I'm strongly mistaken. So the value that your father had in raising you was to allow you to discover the world on its own terms and on your own terms. Do I have that right?

01-00:57:03
Tolley: Yes, you do. That's basically absolutely correct. I learned a lot from him. Actually, in the course of things, we talked a lot of economics. He did believe

in planning. But he kept telling me—. Well, he didn't keep telling me, but he was sort of emphasizing that we need entrepreneurial spirit in the economy. He was very strong on that. I don't think you'll find many institutional economists who will go out on a limb like that.

Burnett: Right.

01-00:57:39

Tolley: But he did believe in planning. Some of the things they say now—and I'm reading Jess Gilbert and looking back on things—he was talking about the value of what he was doing. But the BAE, if we get into that—I think Jess puts it very well—that there's the analytic part, which was kind of what my father was strongest at; then there was an education part, and that was M. L. Wilson; and then there was a third part. But this Third New Deal, which was what the BAE, beginning in '38, did, what did that do? Well, that had these three parts. My father believed in the planning part of it. I never recall his being—he didn't lecture, but he made it clear that he thought planning was a good thing. And he made it clear he thought that we've got to preserve entrepreneurial spirit, or however he put it. But basically, he did not try to guide me in what I was doing.

Burnett: Right. So we talked a little bit about planning. Part of that Third New Deal was this development of democratic planning, the Bureau of Agricultural Economics developing structures that went down to the county level, and they'd have these farm communities that would meet and talk about their needs, and filter information back up and back down again. So that was one idea of planning. Can you talk about the word planning and what it meant at the time, in World War II? It was being used by all kinds of different people. What did it mean to you at the time, when you were—? You're actually in school at that time, but as you become an agricultural economist leader, what significance did planning have?

01-01:00:11

Tolley: Actually, probably not a lot. I think as an ardent young New Dealer, I accepted the idea of planning as really quite a good thing. Over the years, that changed immensely because planning itself changed. Later, when I was doing all this foreign work, every country had its five-year plan and to me, they really mean nothing. They're not connected enough with action. I think my impression—and I don't know the area at all; I won't say at all, but I don't know it in detail—that the land-use planning was what was the big thing. That was planning farming at a very detailed accounting level, basically, and doing the details of it. The people in BAE were excellent at it, and they were doing it democratically and all of that. However, I do think an Achilles heel of it is that you're going to run into distributional questions almost immediately. If you try to help the poor people, you're going to make the power structure mad; and that's kind of what happened, I think, to them. So I became skeptical of it.

I came to Chicago to study the economics, study the free market, all of that, all the wonders of the free market. [they laugh]

Burnett: So the scales fell from your eyes.

01-01:02:02
Tolley: No, not exactly.

Burnett: No, no, I'm teasing. So there was in the air, even for those who were not ideologically motivated by redistributive questions— for example, in World War II, two organizations rise to prominence, the Committee for Economic Development and the National Planning Association. They were not devoted to redistributive questions, but they used the term "planning." Also, in the planning around some of the New Deal, I think folks like M. L. Wilson were inspired, not by socialist revolutionaries, but by Gardiner Means and Adolf Berle, and this understanding that modern corporate capitalism is highly organized and that there's a great deal of planning around the inputs and outputs of major corporations. He was thinking about that when he was thinking about the Allotment Plan; that we need a kind of planning for the agricultural sector because it's such a chaotic organization, or lack of organization. So planning was in the air, and people were trying to adjust to what that meant and define it in different ways, it seemed. It seemed to be something that people wanted to claim; that the free market had acquired a bit of a dirty connotation, I think, in part because of the Great Depression and the failure of the business community to invest after the initial crash. So there was a lot of fear surrounding the perceived chaos of the market, and a desire to manage it. That seems to be the context in which you were starting to study economics. So you'd had this experience of a young person, that you were kind of a New Dealer. You were in favor of these fresh options and trying new ways to organize society for the better, in a more efficient fashion. But you're at American University, and you had your mind broadened by the courses that you were taking and the people you encountered. So were there professors that were particularly attractive to you, in terms of the way they thought or the way they taught?

01-01:05:01
Tolley: No, they were all good. Not really.

Burnett: Okay. But things change when you apply to graduate school. So you finish the Army. You have a couple of years in the Army, so it's '44, '45. But you're studying as part of that.

01-01:05:27
Tolley: Well, and on the side, I took this correspondence course. Then I came back. I think I was probably just at American University for about a year after that, and then I went in the Army. I mean went into graduate school.

Burnett: So you finish American University in '47?

01-01:05:50
Tolley: I think I started at Chicago probably back in '46, in that academic year.

Burnett: When you made the decision to go to Chicago, you had had that early—. You visited Chicago, you decided you liked it, and you were interested in the rough-and-tumble nature of it.

01-01:06:14
Tolley: Something like that.

Burnett: Something like that attracted you. Were you aware of individuals who were there in '46, '47? Were there leading lights that you wanted to study with? Or was it more like the place was important to you?

01-01:06:32
Tolley: I think it was the place. There were a lot of people that when I got here, I found out how famous some of them were and all that.

Burnett: Right.

01-01:06:43
Tolley: Then when we get into T.W. Schultz, then we get there.

Burnett: Well, did you talk about the choice with your father when you talked about grad school? Did he ever have any input? Or not input, but ideas about the choices?

01-01:06:57
Tolley: He never told me where to go.

Burnett: No. Yeah.

01-01:07:01
Tolley: It was always my decision.

Burnett: Yeah. When you told him that you wanted to go to Chicago, was he excited for you?

01-01:07:08
Tolley: I guess so. I'm not sure.

Burnett: As far as you remember.

01-01:07:12
Tolley: Yeah.

Burnett: Yeah, fair enough. Well, it might be a good time to talk about it.

01-01:07:26
Tolley: I should say this. He and Ted Schultz were very close.

Burnett: Okay. That's kind of where I was going, yeah.

01-01:07:33
Tolley: I'm trying to recall. I think he wanted to write a letter. On my oldest brother, he had said, "No, I don't want to help my son in any way," and he regretted that greatly. So my next brother and me, he was always trying to help. I think this is true, that he wanted to write Ted Schultz a note that I was coming. I said, "Don't do that. I don't want any help." So anyhow, we'll come to some more of this a little later.

Burnett: Right, right. Just to finish up with your father, so he finished with the BAE in '46, is that right?

01-01:08:19
Tolley: I think that's right.

Burnett: Yeah. So what was next for him? The family was based in Washington, still in Washington.

01-01:08:30
Tolley: Yes. He went with the FAO, and he was one of the founders of the FAO.

Burnett: The Food and Agriculture Organization.

01-01:08:41
Tolley: Yeah. He worked there for several years. Then FAO decided to move to Rome and my folks said, "Well, we're a little too old to be moving around like this," so he did not go to Rome. At that point, I guess he was not working anymore; I really forget.

Burnett: Right. But that's an incredible career, to have headed up the central nervous system of the USDA, which is the Bureau of Agricultural Economics, and to have shepherded it through World War II, and then to initiate the international organization for gathering knowledge and providing assistance in the development of agriculture in other countries, as well. So it's just a very impressive figure in history.

01-01:09:45
Tolley: Yes, no doubt. No question about it. Not easy to live with as a son.

Burnett: Yeah, that's a big shadow, I imagine.

01-01:09:58
Tolley: Yeah, that's right.

Burnett: He's an impressive man. So you apply to the University of Chicago, to attend graduate school. I imagine you're accepted.

01-01:10:18
Tolley: I was accepted. I really forget the details of that.

Burnett: But you move out there from D.C.

01-01:10:28
Tolley: Yes.

Burnett: And your father then is still in Washington, setting up the FAO, while you're going out there.

01-01:10:36
Tolley: Yes.

Burnett: Okay. Can you describe what happens when you land in Chicago? So in your first year there, who do you meet and who are in your classes? Do you have any recollections of the folks who were in your cohort?

01-01:11:01
Tolley: That's an interesting question. You probably don't even know the name of Harry Markowitz, do you?

Burnett: It does ring a bell, yeah.

01-01:11:09
Tolley: He was in my cohort. He astounded us all because he took all his prelims in one week. Anyhow, Harry wrote a very important paper in finance. He's a leading figure. So I remember that he was in my cohort. The other people who were in my cohort, it's funny, they were not—

Burnett: A year ahead or a year behind? There's a period of coursework where you do the core, you do the price theory course—

01-01:11:47
Tolley: Yeah, right. Those people I studied with, I remember some of them. None of them were particularly distinguished, interestingly enough.

Burnett: It's the immediate postwar period, and the University of Chicago economics department has had an important role. Can you talk a little bit about what you encountered when you got there? The Cowles Commission is there at that time.

01-01:12:20
Tolley: Yes.

Burnett: Can you talk about what that was and how you encountered it?

01-01:12:25
Tolley: Well, Jacob Marschak and Tjalling Koopmans and then, a very well-known Pole, a world-renowned planner. He believed so much in planning he went back to Poland to help them plan. Of course, it didn't work out there.

Burnett: Right, right.

01-01:12:44
Tolley: Do you remember the name?

Burnett: Oh, goodness. I am blanking right now. We'll come back to it. But yes, I know who you're talking about.

01-01:13:02
Tolley: Yeah. Anyhow. So it was a very renowned place. And I had courses with Marschak and Koopmans, actually. I remember I took the most from Koopmans' course. That was way over my head; I don't know why I did it, but I was trying to—.

Burnett: Oskar Lange?

01-01:13:23
Tolley: Oskar Lange, very good.

Burnett: So, world-renowned economists and mathematical minds.

01-01:13:34
Tolley: Yes, right. Definitely.

Burnett: Right. So this provided a lot of support to graduate students, because graduate students were involved in working on problems and projects, weren't they, at the Cowles Commission? I think Arnold Harberger worked there for a while. So it was a stimulating place, in part because of the work that was being done at the Cowles Commission, really pushing the boundaries of economic theory and mathematics. So there's that on the ground.

01-01:14:18
Tolley: Most of the graduate students did not understand the work at the Cowles Commission. It's quite high-level work. Anyhow, it was very prestigious that they were there. Of course, I encountered Milton Friedman and Frank Knight and those very important teachers.

Burnett: You took courses with Milton Friedman and—?

01-01:14:41
Tolley: Oh, yes. Definitely. He was a fantastic teacher. And then there were other teachers. So what's the question?

Burnett: The question for me is, as someone who comes in, you didn't have much of an idea of what Chicago was. You knew it was a good school. But you had undergone undergrad training at American University and you studied some economics. What was different about the style of teaching, about the milieu? What was it like to be a Chicago graduate student in '47, '48?

01-01:15:27
Tolley: You really studied hard to get through.

Burnett: Was there camaraderie among graduate students?

01-01:15:40
Tolley: Quite a bit. I would say normal camaraderie. I lived in a dorm for a while and I lived in International House. I found International House very sterile for some reason. Anyhow, then I moved into a co-op, a coeducational co-op, which was an almost scandalous thing to do.

Burnett: That was a new thing in those days?

01-01:16:09
Tolley: Well, the administration didn't like it. It was co-ed and so this was one big, happy, incestuous family. There was a lot of that going on.

Burnett: That did not help the reputation, I imagine.

01-01:16:27
Tolley: Yeah. It was way ahead of its time. Hyde Park was really an interesting place because it was way ahead of its time.

Burnett: Can you talk about Hyde Park as a place? This university is in a location that has a—. It's part of this large city, but it's somewhat outside of the downtown area. Can you talk about what it was like in the late forties? It's just after the war, so there's all of that dislocation, as well.

01-01:16:57
Tolley: Well, for a young person, it was wonderful. There was so much going on. There were all kinds of things. A lot of artists around, I remember that. A lot of—.

Burnett: Was there nightlife? Was there a main strip where people would go out and —?

01-01:17:14
Tolley: Well, there were parties. Do you know Jimmy's? Were we near Jimmy's last night?

Burnett: Jimmy's was mentioned, has been mentioned in other conversations. So Jimmy's is a watering hole for students and some younger faculty, is that right? It was a hangout.

01-01:17:35
Tolley: Well, that's right. Did younger faculty go? Of course, when I was on the faculty, I would go there a little bit, but it's mostly for students. Then what happens is, you'd be at Jimmy's, and then somebody would say, "Well, so-and-so's having a party." So there would be parties all over the place. It was just a tremendous amount of fun. And there was a lot of living together and things, lifestyles that later became very commonplace, but they were not at that time.

Burnett: So roommates and you said the co-ed dormitory situation.

01-01:18:20
Tolley: Yeah.

Burnett: But also was it a work-hard, play-hard kind of environment, in the sense that there it was a high-octane environment?

01-01:18:39
Tolley: Well, yes. I think it's definitely that. It's either work hard or play hard. Do you know who Mike Nichols was or is?

Burnett: Mike Nichols the—? Yeah. As in *The Graduate*—?

01-01:18:55
Tolley: Yes, that's right.

Burnett: Yeah, okay.

01-01:18:56
Tolley: He was here as a student. Actually, he was a good friend of mine. He was associated with this co-op, too, and he helped start WFMT and so forth.

Burnett: Oh, the radio station?

01-01:19:14
Tolley: Yeah, right. So I saw him on the street once and he said, "George, we're doing a wonderful thing. We're going to play classical music all day." And I said, "God, what a crazy idea that is."

Burnett: Well, what was normally played, the hits, on the radio station? Or bebop or swing?

01-01:19:38
Tolley: Well, we would sit around and play classical records of our own choosing. I know I bought a tape recorder once, and we had a good time making up spontaneous plays. People did a lot of creative things then.

Burnett: Right, right. So it was a really stimulating environment.

01-01:20:03
Tolley: Right.

Burnett: Can you talk a little bit about the core structure of graduate education? So what I've heard from others is that there is this formation. You're turned into a Chicago—. I don't mean it to sound like anything cookie cutter, but there is a common core curriculum that is price theory. I'm not sure it's fully evolved by then, but I think there is a price theory text in '44. Can you talk about the formation? Who was doing price theory at that time? And what that did for

you as a student, in terms of turning you into a Chicago economist, as broad as that is.

01-01:20:57
Tolley: Yes. Well, certainly, Milton Friedman was teaching price theory, and that was a key thing. I had Frank Knight; I think he was teaching price theory, too. Completely different kind of person, but a real experience to do that.

Burnett: Can you talk about Frank Knight and his style? How was he different? Or how were the two of those scholars different, and teachers different?

01-01:21:21
Tolley: Well, Frank Knight did not drill like Milton did. But he had a lot of perspective. He would talk about the function of a person in a situation in an illuminating way. Of course, what he's most remembered for was that he hated Catholics.

Burnett: My goodness.

01-01:21:52
Tolley: He would see a Catholic priest and he would start almost cursing at them.

Burnett: Wow.

01-01:21:57
Tolley: Yeah. You hadn't heard that?

Burnett: Well, I'm not a scholar of—. That is the first time I've heard that.

01-01:22:05
Tolley: I see. Well, I'm sorry.

Burnett: That's interesting. I'm not unfamiliar with that at that time; there was a lot of animosity between Protestants and Catholics.

01-01:22:21
Tolley: Yeah. That was very surprising.

01-01:22:27
Tolley: Then the other people. Let's see. There was Evsey Domar. He was the—. So there's price theory and then there's money. In price theory, as I say, Milton stands out. We had an interesting thing there. We had two communists in my class. They put out a newsletter trying to refute what Milton would say. That was interesting.

Burnett: Do you remember who?

01-01:22:57
Tolley: I don't think I even knew who they were.

Burnett: Okay. In '45 or '46, there was an article in *Fortune* that described Chicago as the last bastion of laissez-faire economics, implying that the rest of the academy—all the Ivies, a number of Land Grant institutions—were looking at the new Keynesian, quasi-Keynesian economic modes. Was there an identity at Chicago along those lines? Or from inside, did it look different?

01-01:23:51
Tolley: I don't know when Chicago—whether it was Jacob Viner—there were a lot of famous economists around. When it did acquire its free-market reputation? That's a very interesting question. I don't know. I think as a graduate student, it's immersion. You just want to get through those prelims. You really work hard at it.

Burnett: You mentioned Milton Friedman's technique was, he didn't—. You said Frank Knight did not drill as much as Milton Friedman did. By that, do you mean he was kind of getting kind of spontaneous—? He was calling on people and asking? Or did you mean that he drilled down into details?

01-01:24:44
Tolley: He drilled down into details; that's what I meant by that.

Burnett: Okay. I see.

01-01:24:47
Tolley: He was also provocative. He tried to state things in a way that you would say, that can't be true. Then you get sucked in. You'd realize, yes, it is true.

Burnett: So seemingly counterintuitive examples that would then really force you to think carefully about hidden assumptions?

01-01:25:13
Tolley: Yes, right.

Burnett: So some great education from Frank Knight and from Milton Friedman. Were there other scholars who stood out in your initial part of the prelims? That's two years before you do your prelims, or one? Do you remember?

01-01:25:36
Tolley: It's one or two.

Burnett: One or two, yeah.

01-01:25:38
Tolley: Yeah. Let's see. I remember the names. Well, let's see. Don Patinkin and Ken [Kenneth] Arrow, actually, they were associated with the Cowles Commission, and they were teaching econometrics and they were very impressive personalities. Don was a wonderful teacher. Ken was a great guy, but a very poor teacher.

Burnett: Were there examples of teaching that you took with you when you yourself became a teacher? Are there figures that stood out and [you] said, "I want to do that?"

01-01:26:25
Tolley: Not consciously. We may all imitate Milton, I don't know.

Burnett: So his personality, his style, is something that was really magnetic, it was really—?

01-01:26:42
Tolley: Yes, it was.

Burnett: Yeah, yeah. It was impressive.

01-01:26:46
Tolley: I was very anti-Milton; I was still a Keynesian at this point. I was very anti-Milton. When I went on the staff, I was teaching Keynesian economics.

Burnett: Okay. So even that late in your—.

01-01:26:58
Tolley: Oh, yeah. Oh, yeah.

Burnett: When you get on the staff. So you finish your preliminary exams. There are other figures there. The chair of the department at that time is T. W. Schultz. Did you study with him? Did you take courses with him?

01-01:27:20
Tolley: I must've taken the ag [agricultural economics] courses with him and Gale [D. Gale Johnson]. I must've done that.

Burnett: Yeah. I think, the first workshop of the workshop system—

01-01:27:34
Tolley: Yes, right.

Burnett: —is agricultural economics.

01-01:27:37
Tolley: Yes.

Burnett: That was one of the first. Then I think money and banking comes later.

01-01:27:40
Tolley: Yeah.

Burnett: Soon after. So were you attracted to that because you knew something about it? Or were your repelled by it because you knew something about it? How did that study sit with you?

01-01:28:04
Tolley: I'm trying to think when I took those ag courses. What happened was, I was on the GI Bill of Rights.

Burnett: Okay.

01-01:28:12
Tolley: I came here and, after the first or second year, somewhere along there, the money gave out. Well, my GI Bill was exhausted. So I did not want to go to my family for help. I was in that stage of thinking about things. So I said, "I'll go to the department and try to get a fellowship." Of course, I ended up talking to T.W. Schultz. I had no intention whatever of going into agriculture. Not at all. He sucked me in with the fellowship. That's why I became an agricultural economist.

Burnett: So at this time, he was known as a powerhouse of activity, working on bringing in projects into the department, working with federal agencies, foundations, scrounging up money for projects that he was interested in, and bringing those into the department. And he had this wealth of experience. He had been advising folks, much like your father, although in the background. He was at Iowa State University and had migrated to Chicago in '43. Did he talk to you about—? Did you learn much later about the auspices under which he came to—?

01-01:29:55
Tolley: That was later, although I knew something about it. There was something called the Chicago Roundtable? It was a talk show.

Burnett: That's right.

01-01:30:05
Tolley: Yeah. My father was on that show often with Ted Schultz. Then he was talking about the National Planning Association. I went to meetings. They used to meet at the Shoreland Hotel here. But my father was a member of that, and so was Ted Schultz. Then when my father would come here, I would sit in on some of those meetings.

Burnett: You did? You sat in on meetings as a young—?

01-01:30:32
Tolley: Well, I had meals with them or something like that.

Burnett: Okay, okay. It would be interesting to be a fly on the wall in those meetings.

01-01:30:42
Tolley: Yeah, right, yes.

Burnett: Yeah. So this was a think tank before the fact, before there were think tanks.

01-01:30:51
Tolley: That's right, it was.

Burnett: This was an organization of individuals from industry, from agriculture, from the academy, from business, from government, labor. Not so much from labor. And they would come together to discuss the pressing problems of the day and they would formulate policy recommendations. Not, "this is exactly what you should do," but "this is something you should think about if you want to do this policy."

01-01:31:26
Tolley: Right, yeah.

Burnett: And they would publish pamphlets, informational pamphlets. And the Committee for Economic Development would do the same thing. So I believe that Theodore Schultz was the head of the agricultural committee of the National Planning Association—

01-01:31:41
Tolley: Uh huh.

Burnett: —and the Committee for Economic Development. Howard Tolley was a part of that. Milton Friedman briefly was—

01-01:31:50
Tolley: Oh, I didn't know that.

Burnett: Yeah, yeah. So there are a lot of— George [P.] Shultz.

01-01:31:55
Tolley: Huh.

Burnett: So there are a lot of figures who were—. Some were involved more than others. Schultz was really deeply involved from the inception of the CED in '42, until long after the end of the war, and the National Planning Association around the same time, as well. So he gets tapped to really be the agriculture person. So he had these connections and he was well respected in the agriculture community and in government. So I understand that Claude Wickard, the Secretary of Agriculture, asked his team at Iowa State to produce a pamphlet on the nutritional value of butter versus margarine.

01-01:32:43
Tolley: I didn't know that's where it originated.

Burnett: They were asked to do that. So they produced this pamphlet. He didn't write it.

01-01:32:54
Tolley: No, Oz [Oswald] Brownlee wrote it.

Burnett: Oz Brownlee, that's right. He wrote it, and that created a big stink with the dairy industry and the Iowa Farm Bureau, and they called for his head, didn't they?

01-01:33:10
Tolley: Yeah.

Burnett: Yeah. I think T. W. Schultz took a principled stand and said, "We can't put this pressure on us to change the results of scientific research." These are the results that we have, and like it or lump it.

01-01:33:29
Tolley: Yeah.

Burnett: So that occasioned his move to Chicago. They'd been trying to get him for years, actually.

01-01:33:36
Tolley: He was coming here during the summers anyway.

Burnett: That's right. Exactly. So not only was he this leader in the agricultural policy community, a well-respected social scientist, but he had also taken this principled stand just before coming to Chicago. So I think his stock went up on the national stage—

01-01:34:01
Tolley: Right.

Burnett: —at that point, as someone who could be counted on to be kind of neutral, objective. So you didn't know that story at the time, but was there an aura around him? Was there a buzz around Theodore Schultz? Or was he kind of more—? I don't know. Well, why I don't just ask you an open-ended question about that? What did you think of him as a person?

01-01:34:30
Tolley: Well, he was head of the department. Because I knew of the connection with my father, so I was very impressed with him. Even so, he was a very powerful personality. When I first interviewed him, I knew that I'd talked to somebody very unusual. He was a very overpowering person.

Burnett: Was he tall?

01-01:35:00
Tolley: Yeah.

Burnett: But he just had an authority about him?

01-01:35:06
Tolley: Whatever it was, he was a—.

Burnett: Yeah. He had something.

01-01:35:09
Tolley: Yes, right.

Burnett: Okay.

01-01:35:13
Tolley: So they gave me a fellowship when I was a graduate student. There's the Lorado Taft house. Lorado Taft did the statue of *Time* at the end of—. You're probably not into all of this local history. The statue of *Time* at the end of the Midway. So there was this house. [interview interruption]. There were three or four or half a dozen of us. Anyhow, I learned so much in that house from these other graduate students. Then I was working on my thesis with Gale, I remember. Then Ted got this grant. It was the first grant. Probably wrote it up here; I don't know. It was the first grant from Resources for the Future. Oh, yeah, that was the Ford Foundation. My father was very active in setting up the Ford Foundation. But their first grant was to Ted Schultz, and it was to study the—this was Resources for the Future—so they wanted to study the use of natural resources in the West. So I was about to finish. So anyhow, yeah, then Ted Schultz had brought Oz Brownlee with him from Iowa.

Burnett: That's right.

01-01:36:56
Tolley: Then Oz was going on to Minnesota. So there was Ted and Gale and Oz Brownlee. So when Oz Brownlee left, then Ted offered me that spot as an assistant professor. My job was to work on this RFF grant for the West, which is what I did for my years as an assistant professor here, for the most part.

Burnett: Can you talk about Resources for the Future? The mandate was to understand the stock of resources, how the resources were being used? Would it have a kind of conservation element to it?

01-01:37:40
Tolley: Probably had that. There was a feeling that we were using up our resources too much, that kind of thing.

Burnett: Right.

01-01:37:48
Tolley: Then—I'm not quite sure I'm putting this quite right—the geographers and others got ahold of it and were running it; but then the economists got in there and they started bringing hard-nosed economics into the picture. Certainly, RFF has been a leading exponent of bringing important economics to bear on that. My father was very active in that. Was riding around somewhere with Nelson Rockefeller. Have you run across—?

Burnett: Nelson Rockefeller, yeah.

01-01:38:34
Tolley: So we were in California somewhere. My father and Nelson Rockefeller were riding around and I was in the car, too. So there was a lot of interesting, exciting things going on there.

Burnett: Of course.

01-01:38:50
Tolley: I think that was the first year of my appointment in Chicago.

Burnett: So that would've been '49 or '50?

01-01:39:02
Tolley: Probably '50.

Burnett: So there's that. You said you were starting to work on your thesis before the Resources for the Future contract came in.

01-01:39:24
Tolley: Yes.

Burnett: So you were working with D. Gale Johnson as your primary advisor, initially.

01-01:39:28
Tolley: Yeah, right.

Burnett: Okay. So were you going to do something on agriculture before the Resources for the Future came in? Or you were just talking—? It was amorphous at that stage, about what that would be?

01-01:39:42
Tolley: Well, I went to Ted Schultz, as head of the department, to get a fellowship, to get some financial support. So they were giving me a fellowship in agriculture. The thesis at that point was, what I was working on, "Earnings of Labor and Capital in the Food Processing Industry."

Burnett: Right.

01-01:40:02
Tolley: Incidentally, there was nothing ideological about it. They really wanted to test— Some people had said, well, people were being underpaid in food processing, and there were monopoly profits in the industry. So they just wanted me to find, what are the facts? What do they earn? So I devoted four or five years of my life to that, while I was basically still a graduate student. That's what my thesis was.

Burnett: It was an analysis of the returns to capital and the returns to labor in the food processing industry. But I guess there was a context in which people were making claims, and those claims had a political valence to them.

01-01:40:56
Tolley: Yes.

Burnett: And you wanted to say, "is this true or not?"

01-01:40:59
Tolley: Yes, that's right.

Burnett: And you did a lot of analysis to show that the activities in that industry were not much different than industry as a whole; that your geographic location had a lot more to do with how much money you made, rather than the industry that you worked in.

01-01:41:26
Tolley: Right.

Burnett: So you did all this kind of careful comparison of industries, of labor markets, and looking at it on a geographic basis. So you did this really fine-grained analysis to complicate a notion that people had that there was unfairness in a particular industry. That's something you wanted to explore in detail.

01-01:41:53
Tolley: Right.

Burnett: But your technique was analysis. It was analytic.

01-01:41:55
Tolley: Right.

Burnett: So that was separate from the Resources for the Future contract.

01-01:42:03
Tolley: Actually, it predated that.

Burnett: It predated that, yeah. It's something that you followed through on your own.

01-01:42:09
Tolley: Yeah.

Burnett: So you were working kind of half time or quarter time on the Resources for the Future project.

01-01:42:16
Tolley: Well, no, I was working as a fellow, as a research associate. I was working on that as my thesis there. Then I was finishing up, basically, or I had not yet finished, and the grant came through. Then I think that Oz was leaving, so Ted Schultz offered me this assistant professor job, and I worked for my remaining years in Chicago, at that point, I worked on the Resources for the Future grant. When he offered me that job, he said, "Now, we'd like you to teach—." There was a three-course sequence in agriculture, and I was to teach one of those, of

course. And he said, "What other course would you like to teach?" I said, "I'd like to teach money or macroeconomics, as it's called today. So I started teaching that. Then there was a lot of ferment going on in the department about that by that time, so I was teaching the Keynesian part of this and Milton was teaching the anti-Keynesian part. We served on the money prelim together. That was very interesting. He said he always wanted his students to know Keynesian economics, so he was always very supportive of my questions and we had a good time there. Then as we'll come to later, I wrote an article that was published after I got to Raleigh, that I called "Providing for Growth of the Money supply."

Burnett: Yes.

01-01:44:14

Tolley: He was very supportive of that article, and he gave me full credit for it. He wrote a book, and one of the chapters, and the main point, or one of the main points that he was crediting me with is a simple idea. When commercial banks deposit reserves with the Federal Reserve Bank, then the Federal Reserve Bank doesn't pay interest. Or at that time, they didn't. So that constitutes a tax. So if the reserve requirements are, say, 10 percent, then you've got a 10 percent tax on money. So I was pointing that out, and it came out of my work on, well we're getting into my teaching career.

Burnett: Well, if you don't mind, we can pause and take that up next day, because that's a whole other phase of your career, getting into your publication of articles and so forth. So we can pick that up next day, and go into some detail about it.

01-01:45:38

Tolley: Okay.

Interview 2: January 30, 2018

Burnett: This is Paul Burnett interviewing Dr. George Tolley for the Economist Life Stories project. It's January 30, 2018, and we are here in Hyde Park, Chicago, and this is our second session.

Burnett: So we were starting to talk about "Providing for Growth of the Money Supply" in 1957, this article for the *Journal of Political Economy*. You were showing that bank deposits with the Federal Reserve constitute a kind of tax on money. This is, of course, under the Bretton Woods system, right? So I don't know if that has anything to do with it. Does this problem get solved later, in terms of the move to floating exchange rates? Does this analysis change everything? Did it have an impact, in other words?

02-00:01:41
Tolley: That's a good question. I really don't know. It had an impact on thinking about money, because then the distinction between so-called inside and outside money became a big thing. As far as I know, this was the first time that was done. Milton got ahold of it and made a big point of it. If we can get the reference somewhere where Milton—. I did want to go back a little bit. After my first year in graduate school, I had run out of money, so I went to the department. I thought, well, my goal, as all young people at that time, I was going to save the world from the Great Depression that had been just before World War II. So in any case, I went to Schultz, as the head of the department. Then he, and I knew him a little bit, of course, but he was an agricultural economist and I was frankly resisting becoming an agricultural economist. I wanted to do my own thing somehow. So I said, "I'm not a farm boy. I didn't grow up on a farm." Then he said, "You must have it in your bones." So he was confident about it. One day we were talking about something being very theoretical, and I said, "No, what you need is a combination of theory and fact." I think that remark got me my job in Chicago. He really liked that.

Burnett: That was his signature conception of economics, right? That it had to be empirically based, it had to be related to real, genuine problems. And that that was an influence on you; and at the same time, you were already there, in terms of how you understood things.

02-00:03:59
Tolley: Well, I think that is a contribution of agricultural economics to economics generally. Empirical work became a much more relevant part of it, as seen in the workshop system. But I had the background, without knowing it, in agricultural economics.

Burnett: So he had this grant from Resources for the Future that gave you some steady income, or some limited steady income, for the next several years, while you worked on that. I did want to ask you that. But just to jump back temporarily to providing for the "Growth of the Money Supply," how did you develop that

expertise in banking and the Federal Reserve system? And how did you develop that concept of a problem in the definition of money and currency, time deposits, all of that? Where does that come from? Where did you learn it?

02-00:05:10

Tolley: When Ted Schultz offered me this job as assistant professor, working with him and Gale and the ag group there, and to work on this RFF [Resources for the Future] project, he said, "You're going to teach three courses. Two in agriculture, one graduate and one undergraduate. What third course would you like to teach?" So of course, I wanted to save the world, so I said, "I'd like to teach the general economy, macroeconomics." So that's how I got to teaching that. Then there was a bit of turmoil going on—. Do you know Abba Lerner? He was a very famous economist teaching at Roosevelt [College] in Chicago. I know stories about Abba. In this co-op where I lived, he took out one of the girls that lived there, who was the cook. So I was eating dinner one night, and here Abba Lerner comes through to the kitchen. Anyhow, that was part of the bizarre life around Chicago. Anyway, so I think the department was trying to hire Abba Lerner, but Milton and other people wouldn't hear of it. Then some of the people began to retire. So first, I taught Marschak's course. That was the Keynesian course. Then Lloyd Mints retired. He taught the history of banking theory, which bored me. That used to put me to sleep, actually. But I taught money. So suddenly I was this unknown junior person, and I was responsible for all of the non-Milton money courses. You asked me how I picked it up. I learned it from teaching those courses.

Burnett: Right. It was a baptism by fire.

02-00:07:22

Tolley: Yes, right. Actually, I wanted to say something about that. I was the Keynesian. Most of the students were ardent Keynesians, and my classes were big and very popular. One time, at some point, I said, "Let's test out this quantity theory of money," which was so unpopular. So I said, "Get data on the money supply, take the logarithms, and regress national income on money supply." And we did it. The class did it for many countries, for many years. The correlations were fantastic. Whenever the money supply went up, the national income went up. The class asked me, "What do you think about the quantity theory of money?" I said, "Well, it's unmistakable. It's true in the long run." I didn't qualify it. But I remember the students were so crestfallen that I said that. But the evidence was so overwhelming that I had to say that. So then toward the end of that teaching, I don't know how I—. Well, I was teaching money and the creation of money. There was Lauchlin Currie; there's a whole history.

Burnett: Right.

02-00:09:07

Tolley: Do you know about Lauchlin Currie?

Burnett: Yeah.

02-00:09:10
Tolley: He actually did a little predecessor work, though he didn't do what I did. But anyhow, I studied all of that and, I don't know, I just got interested in it.

Burnett: Right.

02-00:09:20
Tolley: And it dawned on me it's really a tax on money. So that is, the "Growth of the Money Supply" is related to my trying to get out of agricultural economics.

Burnett: Now, do you talk to others on faculty? Did you talk to Milton Friedman about it and run the idea past other people? Or did you kind of just develop this in the course of working these courses and teaching the classes?

02-00:09:48
Tolley: It just came out more or less at the end. I forget. As I say, Milton and I ran the money prelim together. As I was saying last time, I think, he believed that students should know Keynesian economics, and he liked my questions and we got along very well. I'm trying to recall. When I was leaving Chicago, I met with his workshop one time; but I'm not even sure the idea was completely developed. Anyhow, I finished writing the article when I got to Raleigh. That's about it. It came out of that experience.

Burnett: I wanted to ask you. You said all of your students were ardent Keynesians, and you had had that interest and training and you felt like you were a Keynesian. What was persuasive about the Keynesian economic view? What was convincing about it? What was powerful about it?

02-00:10:57
Tolley: The efficacy of government, of national government expenditures. That was kind of the fiscal side of expenditures. The conservative money people, they just wanted to, as we would say, fiddle with the money supply and Federal Reserve policy.

Burnett: Right.

02-00:11:23
Tolley: It was part of the spirit of the times. Roosevelt was this huge giant, huge hero. Then Keynes, as you probably know, had been a classicist; then he shifted and developed this expenditure theory. It just took off politically, and people who thought that the free market had failed and thought the government was going to be it, well, they just fit right in.

Burnett: It casts a long shadow over the postwar period, to the point where in the late sixties, you have someone like Richard Nixon, who is putatively a conservative, although a realpolitik pragmatist, in the end—

02-00:12:19
Tolley: Well, yes, he certainly was.

Burnett: —saying, "We are all Keynesians now," right? [Ed. note: The history of this attribution is more complicated. The *New York Times* attributed this statement to Richard Nixon on January 7, 1971. The phrase "We are all Keynesians now," was actually coined by Milton Friedman in 1965, but not as an endorsement of Keynes' theory.]

02-00:12:25
Tolley: Did he say that?

Burnett: He did. So this sense in which there grew to be an expectation that the state was responsible for the management of the economy. This is not so much the view now, and hasn't been for decades. But certainly, from the New Deal period up until the seventies, really, there was that view. Chicago folks—there were some Keynesians, as you mentioned. There were people of different economic philosophies in the department throughout that period. But Milton Friedman was this voice, strong voice. So Chicago became associated with this brand of market-oriented, monetarist economics. That's something we should keep in mind, I suppose, as we're walking through the story of your career and the story of other Chicago folks who were operating during this period. But it's fascinating to me that you had this powerful paper. It appears to me that you had been doing this work all your career and this was your major area of expertise. And it was well received, I understand.

02-00:13:52
Tolley: Yes.

Burnett: And it was the *Journal of Political Economy*, so this was a really major economics publication. But did it help you? Because you don't end up working on money and banking throughout the rest of your career. Were there things that you learned from working on that paper and teaching those courses that informed the other work that you do subsequently?

02-00:14:23
Tolley: I'm not sure. It's a very interesting question. I've had a lifelong interest in macroeconomics. When I went back to Chicago, I taught macroeconomics for a little bit; but then I got so enmeshed in this other thing, so I didn't pursue it. I guess I learned to be, if you want to say, original. I followed some idea. It didn't seem crazy, but I just followed that idea. In that sense, I learned to do that in much, if not most, of my later work.

Burnett: Was it a work that, perhaps more than your dissertation, established your confidence as a voice in economics?

02-00:15:27
Tolley: Oh, I think so.

Burnett: That's when it really begins for you, when you say, "I developed something and it was taken up by very intelligent and very well-established economists, and it made a splash in the profession." It was well-received, and that gave you the sense that you were an original voice yourself.

02-00:15:55
Tolley: Yeah.

Burnett: I have a hypothesis about this. That when I look at your work—and we'll get into this later—your work on natural resource economics, benefit-cost analysis, a refrain in your early work around this time is that the current approaches were too narrow, that people weren't looking at the larger effects in the economy. They weren't looking at other alternatives. That was redolent to me of the analysis in the "Growth of the Money Supply:" One change here doesn't just have this impact over here; it has these other impacts. You must consider this as an interdependent system and stop thinking so narrowly. I wonder if that becomes part of your approach. It's something you come up with over and over again. No matter what you're looking at, trying to persuade the reader to expand their notion of what the thing that they're looking at is.

02-00:17:11
Tolley: I hope so. Not consciously. [Narrator Addendum: My article, "Providing for Growth of the Money Supply," *Journal of Political Economy*, 1957, pointed out that failure to pay interest on bank reserves constitutes a tax on money. Milton Friedman endorsed the idea and gave me credit for it in his book. *A Program for Monetary Stability*, Fordham University Press (New York City) 1958. See page 72. Friedman said that failure to pay interest on bank reserve constitutes an interference with the optimum quantity of money. My friend John Conlon, an economic theorist with his PhD from the University of Chicago, has told me that I am the grandfather of Friedman's ultimate full theory of the optimum quantity of money, that since money is costless to produce, it should have a zero price.]

Burnett: So you are working on this Resources for the Future project, which is about Western land use?

02-00:17:33
Tolley: Western natural resources.

Burnett: One of the things that got me thinking about how that was different from regular farm economics, which is thinking about farm income and marketing, and they're thinking about the private farmers who own private land and are exploiting it to the best of their ability and making products that are then sold onto an established market. Is there a geographical determinism going on here when you're exposed to this problem of Western resource use? Because you're talking about land that has multiple uses, right? Is that something that's going on when you're looking at this?

02-00:18:30
Tolley: Well, that is going on, but it really focused so much on water, because water is so important in the West and there's been so much governmental involvement in the development of water resources.

02-00:18:45
Tolley: So a lot of the work was about that. We discovered benefit-cost analysis by looking at water resources in the West. Then we got into how the federal agencies evaluated it. At first, they used so-called secondary benefits, which ignores the fact that when you build an irrigation project in the West, for the most part, you're just taking employment away from other places. But as you get to so-called true benefit-cost analysis, where you map that out, then you have a very powerful tool. That's one of the main things that came out of that. The other thing, since we're talking about it, there was this article, "Optimal Water Allocation in the North Platte River."

Burnett: Yes, 1962, I think.

02-00:19:50
Tolley: Right. So Steve [Stevens] Hastings and Cecil Haver, incidentally—. Just a shot in the dark. Do you know anyone by the name of Haver from Canada?

Burnett: No. Haver?

02-00:20:10
Tolley: Haver. They own land in Saskatchewan.

Burnett: Okay.

02-00:20:14
Tolley: They grew a lot of wheat. But then they discovered oil on their land and they made a very excellent living by just selling the rights to search for oil on it. Anyhow, so Cecil Haver was a character from Canada, and he visited for a while at the University of Chicago. Anyhow, the three of us started out from Chicago. That's when my coat was stolen at 8:30 in the morning. We were on our way to the farm economics meetings in California. Anyhow, we followed the North Platte River all the way to its end and we asked, what is the value of that water everyplace we would look? Out of that, came this article, "Optimal Water Allocation." We were not the first people to talk about salable water rights; but they had talked about partial transfers without a vision of the total allocation problem, allocating it for its maximum usefulness over time as well as over all parts of the water system. So we did that. That article was very well received. But again, that was water in the West.

Burnett: I think what I was thinking about was an article about range use versus grazing rights. So that's another kind of feature. Or is that a different kind of thing?

02-00:21:43

Tolley: No, we worked on that. I don't know that we gave it major emphasis, but we certainly became aware of it. I know grazing rights is still going on, incidentally.

Burnett: Yes. We've see it with some dramatic seizures of federal land and things like that.

02-00:22:00

Tolley: Yes.

Burnett: It did make me think about this exposure to economic problems of resources that have multiple uses and multiple stakeholders, in the general sense, whether it's land or water. I was wondering if that early project was something that set off a light bulb for you, in terms of thinking of benefit-cost analysis. Benefit-cost analysis seems to be something that is undertaken by the Army Corps of Engineers because they're trying to deal with this problem of water allocation and the interventions that they're undertaking in terms of flood control and dams and things like that. But benefit-cost analysis is pretty old, right? It goes back to the French: Jules Dupuit in the nineteenth century. What changes in the World War II postwar era that makes benefit-cost analysis a different kind of set of procedures? How does it evolve in that period that you're working?

02-00:23:27

Tolley: Well, let's see. There is the Flood Control Act of 1936. My understanding of it—this is the recent history, if you will, United States history. So some clerk over on Capitol Hill, at midnight probably, wrote in a legislative clause that said that any of these flood, little berms—any dam, any project like this, it can only be undertaken if the benefits exceed the costs to whomsoever they accrue. We discovered that there's a *Green Book*.[1] It's a little bound paper pamphlet. We discovered that and they had gathered together a group of economists. I don't really know who they were, but I'm sure they were from Agriculture and Interior, I don't know where else. Anyhow, they had done a really very good job of laying out the economics of this thing. So we discovered and latched onto it, and that became the foundation of this. Did we talk about this?

Burnett: No. The green volume?

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[1]United States Inter-Agency Committee on Water Evaluation Standards. *Proposed Practices for Economic Analysis of River Basin Projects.* [Sub-Committee on Benefits and Costs],Washington, DC: GPO, 1950. This report has been updated many times, but an earlier antecedent was the result of research conducted by Maurice Clark, which led to the use of benefit-cost analysis in the Flood Control Act of 1936 and inspired the "Green Book" of the 1950s and subsequent decades. It is this earlier report from the 1930s that Tolley is likely referencing here: Clark, J. Maurice, *Economics of Planning Public Works*, Washington, DC: National Planning Board, 1935.

02-00:24:57
Tolley: The *Green Book*. Then Al Harberger and I—I think we were the only two, well, we were buddies. We were both assistant professors and we drank together and all that. He got very interested in benefit-cost analysis and he spread it worldwide through the Bank [World Bank].

Burnett: Right. And project evaluation and all of that.

02-00:25:25
Tolley: Yes, right.

02-00:25:27
Tolley: So I claim some credit for having gotten him interested in that.

Burnett: Yeah, the green volume is interesting. I think we'll talk about that with respect to the watershed planning volume. But just in these early years, you're publishing a couple of articles thinking about ranges versus grazing rights, and you're working for Resources for the Future, which deals with water rights and allocation problems. Are you also thinking about pricing externalities? Is that something that comes later? That there are benefits that can't be priced? How do you price something that is a kind of free good, right? Is that something that comes into play in that period?

02-00:26:28
Tolley: Of course, that's very, very central later on. It's a basis of the whole thing, in a way, the environmental movement. That's a very interesting question. I'm not sure that we were using that term at that point.

Burnett: So Resources For the Future, I think of that and I think of, say, the Paley Commission report in 1957. So there was, coming out of the government, a concern about the total stock of resources, this understanding that we might be running out of strategic minerals, strategic energy resources. I think Al Harberger was involved in that. There was this interest in resources as underpinnings of civilization, not resources that needed to be shepherded or managed, necessarily. So I don't know if that was more the picture coming out of Resources For the Future. It's more like, these are economic resources or strategic resources.

02-00:27:49
Tolley: Well, my interpretation of early RFF was that they brought hard economics to bear on this. There's a lot of fuzzy ideas that did not bear up under hard analysis.

Burnett: Right.

02-00:28:10
Tolley: That's what I think RFF did, a very key thing.

Burnett: So this is something that you were doing while you were working on your dissertation. We already talked a little bit about your dissertation. It seems when people talk about their dissertations, it's usually understood as kind of your calling card, your career calling card. This is something that defines you in your profession. I don't get that sense as much from you, that it was all that important, in terms of defining your interests or defining the particular brand of techniques that you were going to use. How do you feel about your dissertation in the context of your career?

02-00:29:01
Tolley: Well, I've advised dozens of students. I always tell them, "Do not try to change the world. Just write something that will be approved by a committee, period. You have the rest of your life to do that."

Burnett: Just get it done.

02-00:29:20
Tolley: Yes, exactly. But that thesis problem, in retrospect, it was an interesting problem, but it was given to me by Gale and Ted [D. Gale Johnson and T.W. Schultz]. As we were talking last time, there'd been this talk about possible monopoly and all of that. So they asked me to look at it. I was reviewing it last week. The conclusions were very reasoned. There wasn't any big thing going on. That's what I said and it was interesting. But I was never that deeply involved. I think it made me more of a Chicago economist, because I realized that markets were actually functioning pretty well. People were basically earning as much one place as the other place. I looked at the balance sheets and I couldn't find any huge monopoly profits anywhere. There may have been some imperfections and all that, but it was not a big, big deal. So I learned that out of it. But other than that, I was not avidly emotionally involved in it.

Burnett: There is this narrative among the folks that I've interviewed. In terms of Chicago identity, it is this surprise experience when you look at the data. You're expecting—you perhaps had preconceived notions about how the economy functioned. We talked about Keynes earlier. The narrative out there was that there were pernicious effects of monopolies. We could look at oligarchic concentration and assume that there must be some kind of extortionate rates of profit. Al Harberger was working on his monopoly paper—it came out in '54. He took a kind of national average of corporate profits and said, "Anything above the median is called a monopoly gain." Let's say that all of this excess profit, this arbitrarily chosen excess profit, is due to monopoly. How much does that change things when it amounts to about a buck-fifteen for every person in the United States? So it's not this huge problem [according to Arnold Harberger]. So that was a sense of his experience of surprise by this question of monopoly. Monopoly is a huge question politically in the 1950s, and it certainly becomes so towards the end of the fifties. So was that in the air? You said that Arnold Harberger was a

drinking buddy of yours at that time. Were these conversations being had between the senior faculty and amongst the graduate students, about these kinds of economic problems? Or was it something you had just kind of encountered more or less in isolation?

02-00:32:52
Tolley: I would say just kind of encountered. I didn't realize that Al, on that— But my finding was the same; it was to measure the return to capital. You look at the balance sheets. In the first place, 80, 90 percent of it goes to labor and materials, so there ain't that much left. Then if you say, well, they have to have some return on their capital to invest here—. Pretty soon, if there's any monopoly profits left, it's trivial. That was my insight.

Burnett: Of course, in the 1950s, if you're talking about manufacturing, there are a lot of unionized places, and so there isn't a lot of surplus sort of left over. Then taxation rates are very high. So it might be a different picture, arguably, in 2018, but we'd have to get someone else to look at that again.

02-00:33:55
Tolley: Yes, right.

Burnett: That's another generation's job, right?

02-00:34:00
Tolley: I think so. [Chuckles]

Burnett: But I'm just getting a sense of the circulation of ideas. This emerging Chicago identity for that generation was a sense of being prepared to be surprised by the data, being prepared to be surprised by the empirical results of your research and testing assumptions or testing theory about how the economy works. That's something that you're exploring in your research, and that's something you took away from your dissertation.

02-00:34:40
Tolley: Well, and from that whole experience. Schultz was an empiricist. I know I was—. He was running a workshop. [interview interruption]

02-00:35:11
Tolley: Something had happened to meat prices in the early fifties and he asked me to look into it. He got very excited and very hostile as I began my analysis. There was a break in the data and I said, "That was the commodity price break." And he completely changed, because he realized I had been looking into the situation and knew a lot about it.

Burnett: What was the commodity price break?

02-00:35:50
Tolley: That was those inventories in the meat packing industry. The meat comes in seasonally and they have to store it in these inventories. So it's a risky

decision. If the supply turns out to be very large, then you don't make any money; you lose money on your inventories.

Burnett: Right.

02-00:36:14
Tolley: So it's a risky decision.

Burnett: Right. [interview interruption] The meat inventories paper that you write is presumably an extension of that. It's published in '57.

02-00:36:30
Tolley: Well, when I got to Raleigh, then I worked on that with Cleon Harrell.

Burnett: Right, and that's extraordinary. I don't know if we want to, at this point, just maybe finish this off. Then we can begin your migration to the South. A key piece of this seems to be talking to people in the meat packing industry. You had to learn about what the problems were. I wanted to ask you about that because that's also a common feature of a number of researchers. How important is it to have some degree of insider knowledge of how an industry works, when you're doing this kind of analysis?

02-00:37:20
Tolley: Well, you just naturally need it. Actually, when I was assistant professor, somebody sponsored a summer program and I gathered together about twenty faculty members from all over the country and we spent two weeks at Swift & Company, I guess. We talked to the executives, went around and found out what was going on. We went out to the stockyards once, and the price of hogs was up a nickel. I went up to the hog buyer and I said, "Now, why is that?" He said, "Well, it's just supply and demand."

Burnett: So you actually talked to the folks who were in the stockyards, you took tours, you learned more about the actual problems and the technological change. So a new technique for curing pork that would enable you to do a kind of precure and then freeze the pork, so you could have a longer run of pork inventories.

02-00:38:39
Tolley: Might be, yeah.

Burnett: Yeah. So that was a story that was told. I don't imagine you get that from looking at a time series. You actually have to—.

02-00:38:47
Tolley: No, no, you have to—.

Burnett: You have to talk to people, right? That was an interesting thing. So other Chicago economists have talked about the importance—. I can imagine that that comes, also, from this agricultural economics group—Ted Schultz and D. Gale Johnson—that this is how you do it; you have to talk to farmers, you

have to talk to distributors, you have to talk to processors, in order to understand the problems that are in the data.

02-00:39:20

Tolley: Yes, well, you just do it. When I got to Raleigh, I spent a lot of time tramping around on farms, and when I was studying solid waste later, I went around to the landfills and around to the properties that were affected. You just naturally assume you've got to understand the phenomenon.

Burnett: Right. Can you tell me a little bit about the transition to NC State [North Carolina State University] and how that took place? Are we ready to leave Chicago? I should probably ask that. Are there other things you want to say about that early period, about people that you knew or people that you worked with? That's a period when a lot of people, as you said, were retiring. I think in '56, they're down quite a number of people. Or '54 to '56, there's a lot of retirements and the guard is changing a little bit. Can you talk a little bit about the people that you knew at Chicago?

02-00:40:38

Tolley: Well, we've probably talked about them. As I say, Al [Arnold Harberger] was my good friend. [Narrator Addendum: We should pause here over several non-faculty people I spent time with. One was Steve Hastings. He was a graduate of the U.S. Naval Academy. After his naval service he had become a graduate student in economics at the University of Chicago. We hired him on the RCF natural resources project. He was one of three people I drove to California with to attend the agricultural economics meetings there, in the process of which we spent several days following the North Platte river to observe how its water is used. Steve became the co-author of the *Quarterly Journal of Economics* article on optimal water allocation that received wide recognition. Steve was a very fine economist. We did a lot of exploring ideas together. He was key in economic development work on the effectiveness of the Appalachian regional commission I did for the Army Corps of Engineers beginning in North Carolina that carried over to my return to Chicago. After leaving Chicago, Steve took a job at a Wisconsin electric utility company, from which he walked away with a consulting contract that he used to start his consulting company.

I, my colleague Charles Upton from the Business School (with whom I ran the urban economics workshop and administered the urban field which the Department of Economics approved as an official PhD field—Charles should incidentally be recognized as another faculty member with whom I fraternized) and Yi Wang, one of the post-docs who came with me from North Carolina, worked for Steve's company on his consulting contract. We produced a book G.S. Tolley, Charles W. Upton, and V. Stevens Hastings, *Electric Energy Availability and Regional Growth* (Cambridge Mass.: Ballinger Press, 1977). This experience got me into consulting.

Steve tragically died of cancer. I remember the canon salutes for his naval officer's funeral at Arlington during my Treasury stint in Washington. It reminds me of my nephew Grant Tolley, who is also buried at Arlington, killed at age nineteen in the Tet offensive of the Vietnam War which led me to join in a New York Times full page petition against the war. In the security review clearing me for the Treasury appointment, it was ruled that Nixon's position was so weak that the ad, which ordinarily would have precluded my appointment, was at that point not sufficient grounds for doing so.

A second non-faculty person important in my early years at Chicago was Seymour Smidt. I had met him at the co-ed co-op where I lived as a graduate student. At the time he was a socialist and interested in economics. I attended some socialist club meetings with him. I talked economics with him to the point where he switched his major from sociology to economics. In the midst of his studies he was drafted. It was in the McCarthy era, and he was charged with something, I don't know what. There were star-chamber proceedings at Fort Sheridan just north of Chicago where I testified for Sy. The trial officers seemed to be impressed when I said I would stake my reputation on Sy being a loyal citizen—at least a small contribution to fighting the McCarthy madness.

After returning from the army and getting his PhD in economics at Chicago, Sy joined the Business School at Cornell where he had had an outstanding career. While I was at Raleigh, Sy and I co-authored "Agriculture and the Secular Position of the U.S. Economy," Econometrica (Vol.32, No.4) 1964.

A third non-faculty person from my early faculty years at Chicago was Marshall Kolin. He was interested in anthropology and was close to Robert McCormick who later became head of the Smithsonian Institute. Marshall got his PhD in economics at Chicago and for a time had an appointment at Harvard. Later he had a job at the headquarters of the Postal Service in Washington D.C. working on postal rates in a regulatory setting. Marshall called me on for help. One day his superior called me on the phone and said, "Please take over the postal forecasting work." So in the late 70s I became the chief volume witness for the Postal Service with funding for a few employees who became the nucleus of RCF, Inc.

Over the years, RCF has done a large number of smaller studies. Postal work remains the major activity. RCF has never been a really important user of my time, although we added energy work through Argonne National Laboratory to help out the university's image in this area. This work is now diminished under the Trump administration. I've also done some fairly demanding expert witness work having to do with land-value effects of nuclear plants.

The fourth non-faculty person from early days at Chicago is Yi Wang, already mentioned as a co-author of the book on electric energy availability. He transferred with me from North Carolina as a post-doc and eventually became

a key full-time staff member at RCF where he remained until his retirement a few years ago.

The fifth non-faculty member was G. K. Kripalani, who also transferred with me from North Carolina as a post-doc. He was a distinguished scholar from India who moved on to a faculty position at Western Michigan University, where Vinod Thomas was an undergraduate. On G. K.'s recommendation, Vinod came to Chicago where he got his PhD with me. This led on to my important collaborations with Vinod in later years, as discussed in subsequent pages.

The sixth non-faculty person is Andrew Gunder Frank. I knew him probably better than anyone else did while he was at Chicago. We became friends probably just because he was an interesting person. His father was a famous German novelist who escaped the Nazis over a prison wall. Gunder had been on his own in high school in Detroit. What most others at Chicago did not know, and because of which I learned a lot from him, is that he was as severe a critic as Milton Friedman. The Chicago attitude toward Gunder was summed up by Ted Schultz, who said that Gunder Frank had not made up his mind to become an economist. I don't know if he ever got his PhD. After Chicago, he flourished in Latin America and became one of the world's best-known economists, noted for his criticisms of colonialism.]

To get back to others at Chicago during my early faculty years at Chicago, you were mentioning Cliff Wharton [Clifton Wharton, Jr.]. Those people were around. When I was on the money committees and so forth, I interacted with Jacob Marschak, but I didn't have long conversations with him. I didn't have long conversations with many people other than those I've already mentioned. I think that one thing that Ted Schultz was doing, at that time, the department tended to be just a lot of isolated individuals, not really communicating with each other. Then he started circulating his papers around the department, trying to stimulate things. Then there were the lunches at the Quad Club. That was very important. There was a weekly lunch, with eight or so at a round table. That was a good chance to interact.

Burnett: Whoever could go would go—

02-00:42:24
Tolley: Yes, right.

Burnett: —and then there'd just be a standing invitation.

02-00:42:26
Tolley: Yes. Milton was very tolerant if I was being critical. When was that? The '68 election. I said, "I think Howard Baker would be a good candidate." He got so mad. He said, "What's wrong with Goldwater?"

Burnett: Wow. Was there a lot of teasing?

02-00:42:50
Tolley: Not necessarily.

Burnett: Did he have a sense of humor around these things, Milton Friedman?

02-00:43:00
Tolley: No, not necessarily. He didn't really mind. He was very good about it.

Burnett: Well, there is the workshop system in place, and there is an agriculture workshop, there's money and banking. Or just called the money workshop at that time?

02-00:43:22
Tolley: Yeah, right.

Burnett: There's Al's workshop. I think he said it was a free-for-all. It didn't have a particular name, except the Harberger Workshop. So he would gather up all of the outliers and they would work on problems together. Were there others that—?

02-00:43:47
Tolley: Was there international trade? Was there history?

Burnett: International trade would've been, I think, one. Of course, starting, I guess, with Truman's Point Four [Program], there's the call for technical assistance in international development, right? I think Theodore Schultz gets involved in that quite early on. He's actually doing development-type stuff during World War II. So with the National Planning Association, he has—and I think there's some Rockefeller money in there—the Technical Assistance for Latin America.

02-00:44:40
Tolley: That was TALA.

Burnett: Yeah, TALA project. I think Clifton Wharton, Jr. was involved in that.

02-00:44:46
Tolley: That may be so, yeah.

Burnett: So there were folks who were going down to Brazil and there were all of these kinds of projects going on. So that's another less-well-known feature of the Chicago economics department, that there was an agriculture group; the agriculture group had this kind of subgroup that was interested in international development. That is part of the chair of the department, Ted Schultz, who is interested in bringing funding in, getting graduate students involved to work on projects. That seems to be a really signature style of his. Did that influence you later, in terms of how you understood your role as a professor in a department?

02-00:45:43
Tolley: Well, I think so, although in the Land Grant colleges, they have these research funds and they just, of course, that's probably where he learned that [approach], at Iowa State, because you have a cadre of graduate students and they get their thesis while they're working on these research projects. So it was just a natural part of things.

Burnett: And you could be working with the agricultural experiments station that's associated with the college, or you could be working—. I noted some of your publications and co-publications are bulletins for the NC State Agricultural Experiment Station.

02-00:46:23
Tolley: Right.

Burnett: Right. So that's another connection to the Land-Grant way of doing things, and how that, through Schultz and D. Gale Johnson and others, starts to shape a little bit the contours of Chicago economics in the 1950s and into the sixties. So can you tell me about the transition to NC State? How did that happen?

02-00:46:51
Tolley: Well, in the fifties—. Actually, what Schultz did, and to a certain extent, John D. Black, they were training these well qualified economists. The economics in the Land Grant institutions was not that good. It was fairly good in some places—Berkeley, Iowa, actually, and Raleigh. But in any case, they came to add to their junior faculty, they would come to Chicago and hire out of that pool. So I was interviewed by several places around the country, and I finally went to Raleigh. But it was just part of what was happening at that time.

Burnett: Yeah. Can I ask you then, to get a picture of this network of elite agricultural economics institutions at that time, without casting aspersions on other programs—but the mathematically rigorous, national or regional policy-oriented agricultural economics departments, it's Iowa State for sure, because of Henry Wallace, because of Schultz, and that emphasis on the Statistical Laboratory. That's clearly a central place. There is Wisconsin, for historical reasons, I suppose, which has an emphasis on rural sociology, so a slightly different orientation to farm problems.

02-00:48:31
Tolley: Yes.

Burnett: Chicago is well established. You say NC State was also a quantitatively oriented place?

02-00:48:44
Tolley: It was. It was probably on the make, at that time.

Burnett: Right, yeah.

02-00:48:48
Tolley: Of course, you're leaving out Berkeley.

Burnett: And Berkeley, yeah. Are there others that we're missing? Michigan State, is that an important one?

02-00:48:56
Tolley: Well, Michigan State was on the make, certainly. Did I receive an offer at Michigan State? I nearly went to Michigan State. So I'm glad I went to Raleigh. Michigan State was, well, they're all different.

Burnett: Right. Then John D. Black was at Harvard.

02-00:49:18
Tolley: Right.

Burnett: But that was not an agricultural economics powerhouse.

02-00:49:27
Tolley: Well, he was, of course.

Burnett: Yes, yeah.

02-00:49:28
Tolley: He was towering, yes, I'm not aware that they had a big program. I don't think they did.

Burnett: Right. Are there other leaders? I imagine there were regional leaders. So up in the Pacific Northwest, one of the major Land Grant colleges would've been taking care of that kind of section, if you will, or did it not work that way?

02-00:49:53
Tolley: Well, up there, they did fisheries and fish. They did important work. Who's the famous economist, Zellner? Yeah, Arnold Zellner. He was an agricultural economist working on fisheries. He started out there, then he went to Wisconsin, then he came here.

Burnett: So not a large number, in other words—

02-00:50:18
Tolley: That's correct, not a large—.

Burnett: —of quantitatively-oriented, high-end statistics, econometrics. I think in the sixties, you published a kind of survey—you *did* a survey—of agricultural economics departments, with respect to graduate training, and math and statistics. So you became an expert in what was abundant and what was lacking in various ag economics departments. So there was another connection between Chicago, Iowa State, NC State, and Berkeley? Would you say that there's some migration and circulation of expertise, and graduate students going out, back and forth? Less so with Berkeley, perhaps.

02-00:51:11
Tolley: Well, that was a one-way thing; people were hiring out of Chicago. Then more and more— Frankly, all the other departments were not very high-quality, and they were gradually becoming better and better quality because the training was increasing in quality. But the Land Grant colleges were a club. I know when I was an assistant professor here, I was invited to something in Kansas City or somewhere. It was a group of ag economists. They gave me the cold shoulder, because I was not a member of the Land Grant community. It may have changed later, but I certainly became aware of that.

Burnett: Well, it's true that the University of Chicago is not a Land Grant institution. It's a fascinating outlier, because of its importance in training top agricultural economists, in producing a lot of important and influential national policy recommendations, coming out of the work that Ted Schultz, D. Gale Johnson, you, and others were doing. And it's a bit of a puzzle, right? My explanation of it is Ted Schultz arriving in Chicago and bringing with him an approach to the farm problem and an approach to international development, and finding a welcome home for what he was doing. He was doing things you could not do, and things that you could not say, in a Land Grant institution. He proved it by basically almost getting fired and deciding to quit.

02-00:53:19
Tolley: That's right. That's right.

Burnett: To walk before he had to run. So I think that that explains the anomaly, to some degree. But it also reveals that there's a kind of unique character. Interestingly, at a private institution, there was the freedom to do the research that could not be done at the Bureau of Agricultural Economics, for example.

02-00:53:46
Tolley: That's true. That's true.

Burnett: I can't imagine Schultz replacing your father as head of the BAE in 1946.

02-00:53:53
Tolley: No, no.

Burnett: That would not have worked. So there had to be a place where social scientists could feel comfortable saying what they felt needed to be said about the agricultural economy. Did you feel that way at Chicago? Did you feel that freedom? Or as a new person in it, were you aware of that? Well, through your father, you knew the drama, right? You knew it.

02-00:54:20
Tolley: Well, I was aware of it, yes. But it didn't affect me, really. I guess when I went to Raleigh, did it affect me? I don't know. You don't work on controversial things so much in a Land Grant institution.

Burnett: Well, yeah. And for clear reasons, too, right?

02-00:54:42
Tolley: Right, right.

Burnett: You're a public servant. What ended up happening in a lot of the Land Grant institutions is that the definition of the public has a lot to do with the large associations that are powerful. Not just individual farmers. They don't have an impact on whether or not you keep your job. It's large—the Farm Bureau and the local associations for commodities have a lot of clout, and they feel like the Land Grant institutions are there to serve them. I think that shaped things, to a large degree. Another facet of it comes from Ted Porter's *Trust in Numbers*, which is about the history of social science and quantification and the development of benefit-cost analysis. He goes way back to the nineteenth century. He argues that the quantification of policy is a way to insulate the social scientist from political pressures.

02-00:55:50
Tolley: That's interesting.

Burnett: So that you don't say, "I believe that you should do this because this is the morally correct position." That gets you nowhere because someone can say, "well, I have a different moral position."

02-00:56:01
Tolley: Yes.

Burnett: And so we're at loggerheads. Instead, you argue, "I've added up the numbers, and this is one possible outcome that is suggested by the numbers." So you have a barrier or an insulating layer that protects you from accusations of political bias or—

02-00:56:21
Tolley: Right.

Burnett: Yeah. So benefit-cost analysis has benefits for the practitioner of benefit-cost analysis.

02-00:56:312
Tolley: Right. It does.

Burnett: So NC State came around looking for a new top person in agricultural economics, and that was you.

02-00:56:47
Tolley: Well, yes, and others. Do you know the name of Ed Bishop?

Burnett: Well, he arrived first, didn't he?

02-00:56:54
Tolley: Yes.

Burnett: In '52, he graduates from Chicago.

02-00:56:57
Tolley: Is that right?

Burnett: Yeah. So he was just before you. Then was he head of the department?

02-00:57:04
Tolley: Yes, he was.

Burnett: Okay.

02-00:57:07
Tolley: He was key in, I think, the idea of the Agricultural Policy Institute. He was key in that.

Burnett: I was really interested in that because I wanted to get a sense of the ecosystem in which this kind of knowledge is being produced. So it's Charles E. Bishop, right?

02-00:57:29
Tolley: Yeah, that's it.

Burnett: Yeah. He arrives at NC State and in 1960, he gets a grant from the Kellogg Foundation. I think there's also some assistance from the Farm Foundation.

02-00:57:47
Tolley: Probably, yeah. Are they still going? They used to be in downtown Chicago here.

Burnett: Yeah, I think that was—. The earliest encounter I have with them is that they funded a publication that Theodore Schultz and others put together, called *Turning a Searchlight on Farm Policy*, in 1952. It's a real Schultz product, but a real sort of, "this is what's wrong with agricultural policy and this is the way it needs to be changed." I was interested in understanding the background of the Farm Foundation. I think there's International Harvester money behind that. There's McCormick money that leads to the foundation. But they're an important leader in promoting a particular vision of agricultural policy and agricultural reform.

02-00:58:42
Tolley: They sponsored a lot of work. I've been in countless meetings on Michigan Avenue down there, when I was in Raleigh, getting people from all over to contribute.

Burnett: So they were a big force.

02-00:58:53
Tolley: Yes, they were.

Burnett: Okay. It's something that not a lot of people talk about. Everyone knows about the Rockefeller Foundation, the Ford Foundation, but this is something that's particular to agriculture, thus the name, right?

02-00:59:06
Tolley: That's right.

Burnett: But it has a particular range of interests, the national policy arena, right? So C. E. Bishop founds the Agricultural Policy Institute in '60, and I think it winds down around 1970. So that's a big chunk of the time that you're there. So that sets the background of a little bit about what NC State is. Can you talk about your experience going there? You just said earlier this session that you'd not planned on becoming an agricultural economist. You were trying hoe your own row, trying to develop your own path, and you didn't. You did, but you ended up starting into the family business, as it were. So can you talk a little bit about how you found your feet at NC State?

02-01:00:14
Tolley: Well, I think a lot of it was imbuing economic analysis, taking the Chicago rigor, if you will. Actually, NC State, they had several Harvard economists—they were on the make—and several other Chicago economists, all very able people. It was a stimulating place. Nowhere like this [Chicago], in terms of the power, but still, it was a stimulating place. Actually, Brooks James was head of the department; he's the person who brought me there.

Burnett: Okay. So not C. E. Bishop.

02-01:01:00
Tolley: That's correct.

Burnett: Okay.

02-01:01:01
Tolley: Then Brooks passed away, I think. Then Ed took over. But both Brooks and Ed supported me very heavily. Anything I wanted to do, they would fund and supply—graduate students. I know once there was an evaluation; he said, "What would you like better?" I said, "I'd like more graduate students to work with." Well, they were there.

Burnett: Wow. That's interesting because not every scholar wants graduate students. Can you talk about—? Because this becomes a pattern in your career, right, that you're what one my background interviewees called a prolific advisor. So can you talk a little bit about that, about your enthusiasm for teaching and your enthusiasm for working with graduate students?

02-01:02:05
Tolley: Well, partly to extend yourself. You have these ideas and you can't do it all yourself, particularly when in those days. But even now, I guess, there's so much so-called grunt work. I don't like to call it that, but so much detail work to do. So you just need that, that's all. I know I had a reputation for working late hours with the students.

Burnett: This is, I guess, in the days before you were married.

02-01:02:36
Tolley: Yes, that's right.

Burnett: So you can stay up and have a meeting at one o'clock in the morning.

02-01:02:40
Tolley: That's right.

Burnett: Okay.

02-01:02:43
Tolley: Somebody told a story and I finally had to break it up at two a.m. That didn't happen too often. But anyhow, I was an around-the-clock worker.

Burnett: I think that's perfect for—. Isn't that also the clock of a graduate student? Or typically.

02-01:02:59
Tolley: True. That's right.

Burnett: Ready for anything at any hour. They're kind of free from some of the normal constraints that regular folks have, when their time is entirely devoted to the academy and doing those projects. So you land there. So some of the publications that come out after you arrive, there's stuff that's in the pipeline while you were—. These seem to be, the mid- to late fifties, those are still some Chicago projects that were just being finished up. Is that right?

02-01:03:36
Tolley: Well, certainly, the "Growth of the Money Supply," then the meat inventory work. I now realize that really started there, back in Chicago.

Burnett: Right, right. It would have had to, I'm thinking, because of the connection to the meat packing industry. I think there's also a story going back to the 1920s, that the economics department at Chicago had these links with the meat packers. They had short courses for the economists who worked at Armour and Swift and all of the meat packing companies. So there were these kind of organic links.

02-01:04:19
Tolley: Do you know about the American Meat Institute?

Burnett: Yes.

02-01:04:22
Tolley: Over here on 57th Street.

Burnett: Right.

02-01:04:26
Tolley: Well, that I the graduate student, in that period I used to go over there. I don't know who I was meeting with. But they had a lot of interesting data.

Burnett: We talked about Chicago and the ag economics group being unique. But it's not entirely an accident that agricultural issues have a kind of national profile, would be of interest to scholars in this city. This is an industrial center for the agricultural economy.

02-01:05:05
Tolley: It's true.

Burnett: That would make sense, that things bearing on national policy with respect to the price of feed grains—

02-01:05:14
Tolley: Right.

Burnett: would have an important impact on the meat industry, for example. And it's clear from Theodore Schultz's work on the Committee for Economic Development and the National Association, that he is plugged into this larger community that involves industries that would seem to have nothing to do with agricultural, like the Ford Motor Company or Encyclopedia Britannica. But there were these leaders that would meet in Chicago or Washington, D.C. to talk about the farm problem, and Schultz was the leader of those groups. So Chicago as a city is central, I think, to the story of agricultural economics in the Chicago department of economics.

02-01:06:10
Tolley: Yes, I think that's true.

Burnett: So I didn't mean to digress and go back to Chicago, so let's return now to NC State.

02-01:06:21
Tolley: I think one of the things about the Ag Policy Institute was that it wanted to help farm people in a way that Land Grant colleges usually haven't done. They're very much concerned with incomes and how people earn their living. I guess I had been interested in migration, but I got very interested in it there, where there was so much rural-urban migration going on. I became very interested in what they were doing in the cities. Actually, my interest in urban economics really came out of that. I did my early work in urban economics

there, because I became interested in some of these problems. That's a long story, I guess.

Burnett: It is a long story, and we can explore it. We might even have to go back to Chicago again to get some of that out, because I did want to ask you— and we can talk about it with respect to rural-urban migration—it does double duty, because it's that and it also has to do with international development and farm income policy in the United States. One thing that comes up over and over again in T. W. Schultz's work, D. Gale Johnson's work, and your work is the principle, I guess first enunciated by Ernst Engel—I think, if I recall correctly. It's the income inelasticity of demand for agricultural products. So as incomes increase, only a fraction of that increased income is going to be spent on food or on agricultural products. So if someone makes an additional five dollars, only a dollar of that extra money is going to be spent on agricultural commodities. That's my limited understanding of this principle. So there's a demand problem with respect to agriculture, versus demand for non-agricultural products. That's one thing. There are several features to this. Can you talk about this? What I'm beginning to understand is a Chicago framework of the farm problem. So that's part of it; that's one piece of it. What else is happening that makes the farm problem what it is? What are the other features of this?

02-01:09:10

Tolley: Well, technological change, of course. I don't know where this originated. I would point out that "Agriculture and the Secular Position of the US Economy?"

Burnett: Mm-hm.

02-01:09:26

Tolley: That was central in our work. That's exactly the model. Two sectors; you have agriculture and non-agriculture. You have a demand for each sector and you have a supply. The Land Grant colleges, beginning with the Civil War, were so successful that we had all of this agricultural output. And it was in the face of inelastic demand. Something I came to later with more emphasis is that international trade is a very important part of all this. Of course, trade is still more important to agriculture than many people recognize. We're certainly part of a bread basket of the world.

Burnett: Right.

02-01:10:28

Tolley: So the demand in the rest of the world is very important to what's going on. Looking at the big picture, as an economist, in this case, demand and supply have their characteristics. You put them together, and you get some good outcomes and some very vexing outcomes.

Burnett: Right. I think by contrast to what others were arguing would be good agricultural policy, for example, the old claim of making the tariff effective for agriculture. This argument was that the industrial side of the US economy was protected behind high tariff walls, but since agriculture was on an export basis, they were not similarly protected. So there was this desire to insulate the agricultural economy. I think not just Chicago economists, but a lot of economists were saying, we have to understand what the agricultural economy is and what's happening to it. So the agricultural economy is, and for the foreseeable future will be, on an export basis, and so we have to plan for that and understand that. Industry shouldn't be protected in that way either, but two wrongs don't make a right, is the Chicago position. So there's the income inelasticity of demand for agricultural products, which means that stimulating demand for agricultural products is a bit of a losing proposition. Technological change, because of the success of the Land Grant system, the experiment stations and all of that, means that productivity increases are going way up. And the rural population is going up, as well. So you have too many people on the land doing something that is very, very productive, and its productivity is increasing year on year. So one of the things that is happening is that people are leaving and they're coming to the cities? Some agricultural economists in the thirties were saying, we need to provide a good living for farmers on the land, and we need to provide for small producers and things like that. So there was this agricultural policy that was trying to make agriculture great again, to go back in time, to turn the clock back to an earlier era of prosperity. The Chicago orientation seemed to be, we have to go with the trends. We have to go with what's happening. So several things were happening. There's the basic income inelasticity of demand for agricultural products; there's the increasing productivity; and there is an out-migration into the cities. So engineer agricultural policy so that it moves with those trends. Do I have that approximately right? Was that the basic picture?

02-01:14:04

Tolley: Yes. To me, that's telling it like it is. Economic reality is that inelastic demand, that you have an increasing productivity. I hate to insert myself here, but part of the increasing productivity is that the managerial requirements in agriculture are increasing all of the time. So not only are people migrating, but low-income people are being forced out more than high-income people. Farm business is becoming big business, and it's continued today. I'm shocked when I look back and see. The family farm is gone. We always said, how long is the family farm going to exist? But the economies of scale were not so great until relatively recently. But now there are farms that are whole counties. It's really something.

Burnett: Yeah. There was a dream of factory farming in the teens and twenties, right? It failed at first, the first go at it. There was an ideal of an ideal acreage. The family farm was considered to be the most efficient economic unit for the longest time, but the acreage would keep going up. So I think in your day, in the fifties, it was probably 320 acres for—

02-01:15:45
Tolley: Something, yeah.

Burnett: —wheat, for the large export commodities. Then that would go up and up and up. And I remember in the day of my family's farming and my uncles and my grandfather, they had a section which was 640 acres, and they rented another half section.

02-01:16:03
Tolley: Right, exactly.

Burnett: And that was getting up towards 1,000 acres in the seventies, and now it's upwards of 2,000, 3,000 acres. So we see that trend line change and the nature of farming's changed. So your contribution and your articles—and these are articles at NC State, just to anchor this in the time frame, early sixties, you're writing papers about farm income and you're breaking down what Schultz was talking about a decade or a decade and a half earlier, this out-migration. You're disaggregating it and saying there is a chunk of people who are making more than $10,000 a year on the farm, and the number of farms between '49 and '59 has doubled in that sector, but the number of farms overall has declined by 35 percent. So you give that picture of who is leaving the farm is significant. A really fascinating chunk of your research was also looking at white and non-white. So the non-white farmers were often sharecroppers and effectively hired labor, because they were depending on being hired by another person to do the farm.

02-01:17:27
Tolley: Right.

Burnett: So with production control and acreage reduction, they just weren't being hired, so they would leave. The poor non-white farmer was in a different position. You said something really kind of striking. You said that that farmer would have to fire himself. So he doesn't; he continues in an unproductive small-holder mode and stays where he is. It's a picture of rural poverty that people are starting to talk about at that time. At the national level, there's a big splash of Michael Harrington's *The Other America* in 1962. You're writing about this right before that, right at that time. You are describing what then comes to the attention of the entire country, through John Kennedy and others, right?

02-01:18:19
Tolley: Right.

Burnett: It's a really striking piece of research.

02-01:18:21
Tolley: Yes. Incidentally—this is getting off a little bit, but—I'm trying to figure out what happened in my vitae. Was that when I was leaving NC State? The Corps of Engineers hired me and Charles Levin—I don't know if you know

him; he's a well-known regional economist—to evaluate the effects of the Appalachian program. I spent two or three years on that. But I look at my CV and I can't find it.

Burnett: Well, I can perhaps anchor that, because I think that your papers from the early to mid-sixties, '63 to '65, you make mention of the differences, and again, it's a quasi-racial difference. But you mention the biggest uptake of out-migration from farming had to do with the flatland cotton areas, because of the mechanization of cotton. The productivity goes through the roof and you don't need all of that farm labor, a lot of which was non-white. The hilly areas, the piedmont areas, are not amenable to that, and that's where you end up with these pockets of rural poverty. So there's a technology piece to it, there's a socioeconomic stratification piece to it, and there's a racial piece to it. You identify all of that. So in spite of yourself, you're kind of ending up as a bit of a rural sociologist.

02-01:20:08
Tolley: I see.

Burnett: No, I think you're very quantitative in your orientation. But you're paying attention to the demographic issues, the racial composition. And others were, too. So I notice that you were gathering research from other experiment stations. Right around '59 and '60, there's a raft of studies that come out of the various experiment stations across the country, looking at farm income and labor and race. It's that kind of analysis that was stopped during World War II, right? The Bureau of Agricultural Economics, your father was in charge of some of those investigations that were being undertaken, not even the controversial ones. There were senators and congressmen who would not allow the gathering of statistics that the Bureau of Labor Statistics would undertake in the normal course of its investigations. So it wasn't just like some kind of leftist ideological thing; it was that they were not allowed to gather data, period. It takes another fifteen years before that kind of research is undertaken again. So there's a kind of a fulfillment of a legacy, inadvertently; I'm sure you weren't planning to do that. But it happened that you were participating in agricultural economics research that was looking in a fine-grained way at rural poverty and trying to understand it.

02-01:21:53
Tolley: Well, I guess that's true, yeah.

Burnett: So the Army Corps Engineer work must've been late fifties?

02-01:22:03
Tolley: I think it was later than that.

Burnett: Okay. Early sixties, mid-sixties?

02-01:22:07
Tolley: Or late sixties. I'm just trying to recall.

Burnett: Yeah, yeah. From '59 to '65, there's a southern land tenure research committee.

02-01:22:21
Tolley: Southeastern Land Tenure Research Committee, yes.

Burnett: Okay. So can you talk a little bit about that and how that relates to the work that you were doing?

02-01:22:35
Tolley: Well, I'm trying to remember. Well, I was a member of that. I think Fletcher Riggs was. That was all the Land Grant colleges from the Southeast. It was not a high-tech group; they were older persons; they were not sophisticatedly trained or anything like that. But I forget what we ran through there. Actually, we were trying to goose up that group and get them interested in more interesting things. Do you have any titles from that period?

Burnett: Now I opened my big mouth and, let me see here. Well, I'm going to have to find the exact reference.

02-01:23:47
Tolley: We may have sponsored a major conference; I really forget. Some things that should be mentioned. One there is the Asheville area, Western North Carolina. The TVA [Tennessee Valley Authority] sponsor was studying the economic development of, basically, the Asheville area; it was more the agricultural part of it. But Fletcher Riggs and I worked on that together. He was responsible; he wanted me to be key in it, which I was. I did a lot of work on local economic development, at that point. That very much dovetailed with the Agricultural Policy Institute, because that's the kind of thing that they were interested in.

Burnett: Okay.

02-01:24:39
Tolley: Fletcher Riggs deserves some credit for really sponsoring that.

Burnett: You also collaborated with, you co-edited, the volume on watershed planning [G.S. Tolley and F. E. Riggs, eds. *Economics of Watershed Planning,* Ames: Iowa State University Press, 1961].

02-01:24:54
Tolley: Yes, with Fletcher. That was probably the first thing.

Burnett: Can you talk about how that came together? Because that is just such a wide range of folks. There's S.V. Ciriacy-Wantrup, who writes the introduction to it and it's a powerful piece on watershed planning. I guess the impetus for it is in

a couple of things. There's a Public Law 566 that has to do with watershed analysis. In 1958, I think that's the green volume that comes out.

02-01:25:37
Tolley: Well, the "Green Book" was 1936.

Burnett: Oh, 1936. Okay. All right. So this is something else. Okay, so the *Economics of Watershed Planning* came, in part, out of the Southeast Land Tenure Research Committee.

02-01:26:18
Tolley: That's probably what we were, yes.

Burnett: That was supported by the Farm Foundation and the TVA. It was published by Iowa State University Press in '62. And Fletcher Riggs was from the TVA; that's what you said.

02-01:26:35
Tolley: Yes.

Burnett: And that's who you co-edit it with. It was quite something. It's interdisciplinary. Can you talk about the range of disciplines that are featured in this book? It's not just economists, right?

02-01:26:54
Tolley: Mm-hm.

Burnett: So there's hydrologists, there are engineers, there are all kinds of experts. It's a multidisciplinary group that is exploring this question of watershed planning and management. How did that work? Did you have a conference or a meeting, bring everyone together? Or was it through correspondence that you reached out to folks?

02-01:27:23
Tolley: Well, there must've been a conference. But then it was a lot of work. I know Fletcher and I put in a lot of work on that. Yes, I think it—. Later, I worked with Argonne [National Laboratory] and a lot of interdisciplinary work with engineers, and that was the predecessor to that, I'm sure.

Burnett: Yeah. That was your baptism.

02-01:27:47
Tolley: Yes, that's right.

Burnett: You do talk about the role of the economist in that kind of research. I think you were a little bit dismayed by the state of benefit-cost analysis up until recently, and you felt that there needed to be a more sophisticated approach. So you talked about benefits that are complementary, but there are also ones that are in competition with one another, so you need to have a more

sophisticated way of talking about and measuring these things. You talk about the importance of competition at the margins. So there's an economic understanding of these things. You talk about the screening function of economics with respect to benefit-cost analysis. I thought immediately of Al Harberger, too, when I think about the various development projects; that the value of the economist is often to say, "don't do that, don't do that." Then to narrow it down and say, among these choices, these are the most economic and efficient ways of undertaking things. Does it also go beyond economics, when you're looking at these things? Because often when you're talking about these things, there's a social policy that's established, right? So you can't necessarily apply an economic rationale. So can you talk about these kinds of externalities? How does the economist bring their expertise to these questions of these things that appear to be outside of the price system?

02-01:30:07
Tolley: Well, let's see. This brings to mind really two things. So much of benefit-cost analysis, particularly in this country, has been to counter log-rolling. So many projects make no—they waste just so much money. One of the functions of benefit-cost analysis is to screen those things. So you have a lot of people [who] think benefit-cost analysis is searching for *the* perfect project. But you've put it better the way you said it. What you do is screen out the real dogs, and it really has a tremendously important effect on that. Then you're coming to the other things, which is so-called non-market values and so forth, and now we get into externalities and the rest of it. That's what the environmental, the more recent environmental work. It's almost taken for granted among many economists, I think.

Burnett: And that gets into the whole carbon tax and those kinds of things—

02-01:31:30
Tolley: All of that.

Burnett: —to bring in kind of an economic rationale to putatively non-market goods. Free goods, for example.

02-01:31:42
Tolley: Right.

02-01:31:46
Tolley: So a lot of that—we're getting ahead—a lot of the work that I did with Argonne, we got into air pollution, disease effects, and all of that. We were quantifying those effects. We, frankly, started a lot of that work back in the seventies.

Burnett: Yeah.

02-01:32:06
Tolley: It's still going on bigtime now.

Burnett: Right, of course. I wanted to ask about S. V. Ciriacy-Wantrup. He wrote the introduction to *Watershed Planning*. It was a really interesting introduction. He writes, "Optimization is not and cannot be an actual policy objective. Optima are useful scientific fictions." But he also says that extra-market decision making is already part of the political process. I think that's what you were saying with log rolling, right?

02-01:33:03
Tolley: Uh-huh.

Burnett: So people are making all kinds of value judgements, all the way to venal decisions about what would benefit their constituents or themselves personally, and so economists should get into the game, basically.

02-01:33:21
Tolley: I see.

Burnett: So what did you know about him at the time? Did you develop a relationship with him? What was his role in your life?

02-01:33:38
Tolley: He was a good economist. He was an excellent economist. He took an interest in me. At one point, then—that was in '6—. I was on the Berkeley campus at the time of the Cuban Missile Crisis.

Burnett: Yeah, '62.

02-01:33:56
Tolley: Yeah. It was because of him, I was invited to spend a semester out there.

Burnett: Okay. It was just a semester?

02-01:34:04
Tolley: Probably.

Burnett: Okay, yeah.

02-01:34:06
Tolley: Was it a whole year? I'm not sure.

Burnett: Yeah.

02-01:34:09
Tolley: Anyhow, that's—. So he was a very broad guy.

Burnett: What was your exposure at Berkeley? It's a different economics department. Can you talk about how that was different? Did you get exposed to new folks, new ideas there?

02-01:34:39
Tolley: I don't know, I've lost track of the group now. It was a very excellent group of people. They were having problems finding students. Davis was getting all the action.

Burnett: Of course, yeah.

02-01:34:54
Tolley: But I had a very good time there. A lot of excellent people. We interacted on a number of fronts. Ciriacy was kind of isolated, but I worked with the others, as well. Then I went back in '70. There was a time, was I going to be in Chicago, was I going to be in Berkeley? But I really wanted to be in Chicago, so that's the way it worked out.

Burnett: Right. So you had to choose at one point, between whether you were going to go and take up a post at Berkeley, as opposed to coming back to Chicago?

02-01:35:37
Tolley: Well, that's when I was out there in '70. That was kind of the idea. It never got that far, but that's why I was there.

Burnett: Right. Folks say that visiting professorships, that's a trial, isn't it—

02-01:35:50
Tolley: Well, it's usually, to see whether there's a good fit?

Burnett: Okay. So that's interesting.

02-01:36:00
Tolley: So I've been in and out of Berkeley all my life.

Burnett: And they were already moving towards a natural resource economics.

02-01:36:10
Tolley: They might've been there by that time.

Burnett: Yeah. In part, because UC Davis comes into being and it becomes *the* agricultural college for the UC system.

02-01:36:23
Tolley: Right.

Burnett: Right. So it would make sense then that Berkeley take on more of a national-policy profile, becoming, perhaps, more Chicago-like, in that sense. Did you feel comfortable there, in terms of your economic analysis, and that it fit well with the people who were there?

02-01:36:48
Tolley: It didn't clash with it. That's the way I would put it.

Burnett: Right.

02-01:36:56
Tolley: Well, I don't know where we are in the whole scheme of things. Back in the late sixties, basically—was that when it was?—I did this book called *Study of US Agricultural Adjustments*?

Burnett: Mm-hm.

02-01:37:12
Tolley: I notice that was a publication of the Ag Policy Institute. But that's quite a bit related to what you were saying earlier. See, you have agriculture and you have this rapid technological change, and it's impacting people differently. That's where managerial input becomes very important. Then because there's an intergenerational thing going on, if you're a young person, it's very unlikely that you're going to stay in agriculture. Everybody knows, and I've studied it a great deal, you have the age selectivity of migration. But then there is a migration selectivity. That *Study of US Agricultural Adjustments* was working out a way, a model for modeling that, so that you're going to know what's going to be happening in agriculture five or ten years from now. You've got to look at the managerial groups and their mobility and how the overall situation is impacting, and the managerial groups are competing against one another.

Burnett: Right.

02-01:38:44
Tolley: I feel if I'd stayed at Raleigh, I probably would've developed that idea much more clearly. Looking back, I still think it's a wonderful idea.

Burnett: Well, it was a multi-year project for you, because in '63, you publish with Hjort.

02-01:39:11
Tolley: Howard Hjort, yes.

Burnett: Yeah, Howard Hjort. "Age Mobility and Southern Farmer Skill – Looking Ahead for Area Development." And that's where you do the analysis that I was talking about earlier, where you take all of these studies on labor—labor and income studies, basically—from '59 and '60, and you conclude that acreage limitation squeezes out non-white labor, but poor white labor is more likely to stay because they would have to fire themselves. That's what I was saying earlier. So you may need area development for older farmers, who have limited mobility. I think going back to Schultz's recommendations in the forties, I think '49 is kind of his big piece, *Production and Welfare for Agriculture*. He had to bring people with him and so he had to make his case as simple as possible. But it did leave some people behind. I think Schultz's plan for agriculture was to help those who were on the cusp of modernizing their operations to do so. That was the vision for agricultural policy that he

foresaw, that it was supposed to go with the modernizing trend. But not everyone can modernize, if they have limited resources, right?

02-01:40:40
Tolley: Uh-huh.

Burnett: Maybe that's a good way to talk a little bit about your early encounters with international development. You don't write about it; you're not as interested in it as others at Chicago. But you do say some important things about it. International development becomes a big academic industry in the 1950s, and especially in the 1960s, which is called the United Nations Development Decade. There's a whole bunch of different theories about how to best develop an economy, especially in a poor country. Can you talk a little bit about what you felt was wrong with how people were understanding development?

02-01:41:37
Tolley: The basic problem was that people sought to protect industry and develop industry, and actually neglect agriculture. But I guess it was Chicago or some—well, Ted Schultz was very much a part of it, too, and Al Harberger, to change that view; that you need to open up an economy. Of course, you go to South America as the example, the very bad example. Then the Asian Tigers are the good example. They opened up their economies and boom, they developed amazingly. So I just naturally accepted that.

Burnett: I think you wrote some critical analyses. In the sixties, there were two notable and different interpretations of economic development. One was Theodore Schultz's position in *Transforming Traditional Agriculture*. There's Arthur Lewis and his two-sector model, and his understanding of rural unemployment as this kind of disguised unemployment, that there is a lot of idle labor, basically, who are only employed part-time or not at all, and a lot of that could be siphoned off into the cities, with the right incentives through taxation or what have you. Then they would take up this ready supply of labor that would work for low wages, and you could have an industrial takeoff as a result. Schultz hated that. He really hated that position, and argued that farmers are busy wherever they are. They're working almost constantly to feed themselves and their families. So they respond like other people to incentives. I think part of it that bothered him was this notion that these are different kinds of humans, that the development space is a particular kind of space that requires a special economics and a special theory. I think you and T. W. Schultz and others felt like that this is just an economic space, and it responds to the same kind of laws of supply and demand, and the same incentives as other things. Speaking of the income inelasticity of demand, you wrote a review of John Mellor's book on economic development in '69. One of your issues was that he was writing an introductory book, *The Economics of Agricultural Development.* I think he was trying to reach a broad audience. He would write something like, "The percentage of population that's not in agriculture is an indicator of development." And you really responded to that,

[the argument] that development is about increasing food production. And you said, "No, it's not about just basic increases; it's about producing the process of productivity increases." So that's the ag economist in you coming out, I think. So is the Chicago approach applying the lessons of technology transfer, agricultural extension, investment in people, to the international scene? Is it saying that international development is not a special case of this postcolonial space that requires protection? What happened in the United States *is* economic development. It's economic development of the South; it's economic development of hinterlands. And what worked in the United States was the Land Grant system. Is it, in a sense, a defense of the Land Grant system, when you're looking at this?

02-01:46:53
Tolley: Well, it turns out to be that, but I think there're two separate thoughts. Competing with Ted, of course, the Arthur Lewis model is—. It's not worthy. Actually, there was an anthropologist here. What was his name? He wrote a book called *Penny Capitalism*.

Burnett: Sol Tax.

02-01:47:25
Tolley: Sol Tax. And I think Ted's point was the same point, really, that they're just people earning a living; that's all they are. So I'm certainly with that. The work I did on "Agriculture and the Secular Position of the Economy," that certainly assumes that labor markets were working.

Burnett: Right. I think in *Transforming Traditional Agriculture*, Ted Schultz cites Sol Tax.

02-01:48:01
Tolley: Yeah, I'm sure that he did.

Burnett: Yeah. So there's a—. I should include Sol Tax, I suppose, as part of the thought collective at Chicago that is thinking about international development and thinking about agriculture.

02-01:48:19
Tolley: But he was in anthropology.

Burnett: In anthropology, yeah. It was a subfield for a while, economic anthropology, right? So it has a whole other trajectory.

02-01:48:30
Tolley: Right. I wanted to continue a little about the economics of agricultural adjustment. That was trying to work out a technical way, if you will, to predict what's going to happen when these people of different managerial abilities and incomes start competing against one another, and who is going to be left at the end of five or ten years and so forth. In that book, we did an initial stab at part of the US to do that. But I think if we go back to the Depression, the

Agricultural Adjustment Administration, what is agricultural adjustment all about? That's really kind of what it is. When they were trying to do the land-use planning in the Third New Deal—that's what it was about, really; that if you're going to plan land use—of course, that was my problem. You're going to run into inevitable conflicts when you start bringing that out. But in terms of understanding the investments that are going on, I still think it's needed, and I'm very interested that you're pointing it out. It kind of comes out of what I did with Howard Hjort in the other work. [Tolley and H.W. Hjort, "Age-Mobility and Southern Farmer Skill: Looking Ahead for Area Development," *Journal of Farm Economics*, 45.1 (February 1963): 31-46].

Burnett: Yeah. It was part of an awakening to the realities of poverty in the United States at the end of the fifties. I think everyone was accustomed to—. I mean, [Kenneth] Galbraith wrote *The Affluent Society*, right? So there's that. But there is this other America that wasn't making it, that wasn't prosperous. And that became— Kennedy read *The Other America*, and apparently, that became part of the impetus for The Great Society, right? That there was this understanding that there was a population left behind.

02-01:50:45
Tolley: Well, Jack Kennedy went to West Virginia and talked about that and defeated Hubert Humphrey, so he got the nomination at that point.

Burnett: Right, right.

02-01:50:58
Tolley: So there was an Appalachia then.

Burnett: Right. Yeah. In the case of the New Deal, the democratic planning part of it was one thing; but I think there were all of these experiments around the Rural Resettlement Administration. So you move 100,000 people from their homes and put them down in an area where it's thought to be more profitable for them to live, and most of them ended up moving back. So I think a lot of the reformist experimentations, they only worked to the extent that you had this kind of democratic planning. They didn't work in places where you didn't have a lot of democracy to start with. So in the South, in the rural South, there was an established structure, an established order, and I think that the Farm Bureau was more successful at adapting itself to that climate. Schultz pointed that out when he went and toured the South as a young man. He wrote in his diary about the ways in which the Farm Bureau manipulated the system. He said, "There's a lot of humbug in this Farm Bureau thing." So I don't know if he had an early animus against the Farm Bureau, but that's what he experienced and what he encountered. But I think in your case, you were really trying to understand the complexity, the social and the economic complexity of the farm problem, and trying to see how it would unfold in time, because there were these age cohorts. I remember that being a feature of your writing.

You're saying, this cohort's going to be there and this is going to be a problem out to 1990.

So you were trying to get a sense of how these parts move over time. Is that also a feature of the new benefit-cost analysis? Does it become—and economics generally—does it become more successful at unfolding likely outcomes over time? Does it become more sophisticated in that way?

02-01:53:27
Tolley: It becomes more sophisticated in that way. I'm a bit of an agnostic, if not a skeptic. Much of this projection to the future is not very well taken, in my opinion. Well, we're getting off, but we're getting into climate change and so forth, people who try to say what's going to happen to the climate and all that. But there's a fellow who I think I agree with, Geoff [Geoffrey] Heal. He says we should treat it as an insurance problem. That we don't know what's going to happen, but there is a possibility that something bad will happen, and we should take some measures to combat that. But to pretend that we know what's going to happen in two or three generations, it defies common sense.

Burnett: I think George [P.] Shultz talks about climate policy as an insurance policy, so I'm wondering if he's getting it from the same source.

02-01:54:59
Tolley: I don't know.

Burnett: Yeah. I think he has that understanding or that approach. There's another kind of concept that comes out, to do with risk, in the 1950s. And it's germane to bring this back, the inventory theory, in the mid-fifties, A. D. Roy's safety-first model.

02-01:55:29
Tolley: Now, we did not use the safety-first model. I think the safety-first model might be good for climate change. If you really don't know about the future, there's a disaster level out there and you've got to pay to avoid that.

Burnett: Right.

02-01:55:52
Tolley: But if you're able to project a so-called probability distribution, you can say something about the likelihood of various outcomes. Then you can do much better than the safety-first model. That's what we did in that inventory paper.

Burnett: Right, and that's "The Management of Meat Inventories," from 1957.

02-01:56:11
Tolley: Yeah, right.

Burnett: Yeah. That's a whole complicated subject of risk analysis, right?

02-01:56:22
Tolley: Yes.

Burnett: And that's maybe a bit further afield. So I would suggest that we pause, and we'll take up next time to continue talking about these issues.

02-01:56:33
Tolley: Fine. Good.

Interview 3: January 31, 2018

Burnett: This is Paul Burnett interviewing Dr. George Tolley for the Economist Life Stories project. This is our third session. It is Wednesday, January 31, 2018, and we are here in the Hyde Park, Chicago. We're still in the 1960s, and roughly still in NC State, although some of the publications we'll be talking about came out later, after your move to Chicago. But I wanted to continue talking about this more sophisticated understanding of the agricultural economy that you and your colleagues and your students were working on in the late fifties, up until the mid-1960s. You wrote a number of articles during this period. A lot of it has to do with understanding how things were changing in the agricultural economy. I'm wondering if we could talk about perhaps some examples of how things were changing. In North Carolina, it's tobacco country and a little bit of cotton. For the research that was happening at the time, what was happening to the agricultural economy that we needed to pay attention to more?

03-00:02:08

Tolley: Well, of course, rural-urban migration was going on. There was a tremendous amount of that happening, and there was management practice, technological change was going on, all of that. When I first went to North Carolina, I spent a couple of years tramping around on the farms because I wanted to see what was going on. I learned a lot about that—the variety of people and the sharecroppers and the non-sharecroppers, and the people of the piedmont and the mountains versus the coastal plains, the great variety of things that was happening. Then I got interested in this agricultural adjustment when there's all this competition among people of different ages. They share different mobility, and then different managerial capabilities, from very high to very low. I remember I was working on the NC State campus—it was the School of Agriculture—and there was a lecture hall next door. I opened the door one day and there was a big butcher block out there and they were giving lectures on how to slaughter a calf or something. Not quite what I was used to at the University of Chicago.

Burnett: That's pretty hands-on, isn't it?

03-00:03:51

Tolley: It is, very much. So that was good; that was really a meaningful experience for me, to get that close to things. So what's the question?

Burnett: Well, so you're trying to disaggregate the farm problem and not say it's a farm problem. I think T. W. Schultz outlined the basic contours: people are leaving farming for the cities. Contra the New Deal policy approach, which was— we need to make life better for farmers and they should be able to stay in farming if they want to— he was saying, "don't buck the trend." Let's follow the trend and see what we can do to make farming more efficient, because the more people who are not in farming, that's more consumers for agricultural

products; and the ones who stay behind invest in their farming technology and inputs and are able to produce more food for less, more food at a lower price. It drives the price down. That's the opposite of New Deal policy, which is trying to drive the price up, right?

03-00:05:04
Tolley: Yeah.

Burnett: Well, that's an unfair characterization or an oversimplification of it. But effectively, price supports; it's literally what that means. So you're trying to figure out who's staying in farming, who's leaving farming, so that, if you understand the complex nature of the problem, then you can have a more targeted policy approach, I imagine. You would make some policy recommendations at the end of most of your papers, but you weren't in policy making, at least at that time, for most of that period.

03-00:05:47
Tolley: Right.

Burnett: One of the things you were looking at—it's an article that comes out after you're at Chicago—was "Management Entry into US Agriculture." [*AJAE*, 52.4 (November 1970): 485-93.] You mentioned this in our last session. It's quite striking, the portrait. So between 1954 and '64, you stratify it into these basic categories—for I think at least articles, you do this—where there are those farms which have less than $10,000 of annual sales, and there are farms that have more than $10,000 in annual sales. So just a basic split between those two groups. For the group that had fewer than $10,000 in sales, in that ten-year period between 1954 and 1964, 1.3 million farms leave and exit. There's a net exit of that farm group. On the other side are the farms that have more than $10,000 of annual sales, there are only 200,000 farms that enter that on a net basis. But the overall output is greater, right? It's a ratio of six to one between those who are leaving and those who are staying behind. But there's also a sociological profile, so you explore that, as well. So who is staying behind? They tend to be younger, better educated, with a greater willingness to adopt new inputs, new ways of doing farming. That's something that you're exploring with your students, and your students go out and do this research, look at different sections of the country. There's usually some kind of technological transformation taking place. So for example, in the Northeast, the giant tanks for dairy farms, those come into adoption. So that's a really capital-intensive undertaking.

03-00:08:22
Tolley: Yes.

Burnett: But it has huge dividends, in terms of productivity and the ability to store and that kind of thing, and hedge against the market. So you're exploring, I think, the challenges of these transformations, and you're thinking about, how does the government adjust to this? How does the US society adjust to this? What

are some of the conclusions that you come to or that some of your students come to, in terms of, do we facilitate this? If we did facilitate this transformation of agriculture, how would we facilitate it?

03-00:09:19

Tolley: Well, as I say, I was not deeply into policy. I was just trying to understand what was going on. For, at this point, my own political reluctance, I was pro-New Deal still. However, I think I was ambivalent, because in spite of everything, I think the major thing would be to let the market work, just as T. W. had said. I certainly really didn't question that. It was more finding out how the market worked and what the adjustments were. The market was working in rather complex ways, and that's what I was trying to figure out. Really, I think the idea was to try to understand and predict this better, and assume that the policy makers or whoever would be able to use this information in a useful way. But I was not getting into the policy side of it.

Burnett: The impression I get from these articles is that there's a level of surprise, by the speed with which this transformation is taking place. I noted in one passage, you're talking about the human agent being really important. So human capital is really important to understand what's happening, the changes in the quality of the farming community that is successful. But this has implications, when you're thinking of government, if you're thinking of the Land Grant system. The Land Grant system is reaching out and bringing high technology, the latest technology, the latest inputs to the farmers, through the extension service and through the education system. But there were lags. I think you mentioned that in the South, they were still training people to be farmers. I think maybe the butcher's block is a good example of this kind of, "this is how you farm." What you were seeing is, we need to think of these people as managers of multi-hundred-thousand-dollar operations. There's a managerial component to this. Farm management is very old, but I think what you were suggesting is, this is a whole new scale of management that needs to be considered, at least.

03-00:12:20

Tolley: Yes, I was. That was one of the major things that I was interested in and doing.

Burnett: Right. Another striking piece of information is the proportion of the population that is in farming. You graph this and you project it out. This is in the early 1960s; you project it out to 1980. The trendline, if you follow it, it goes right to 2018. You can see that your prediction is actually spot on. In 1980, 6 percent of the population is in agriculture, and today it's 2 percent. If you follow the graph right down, that's exactly where it would end up in 2018. So you continued the Schultz tradition of following the trendlines, the basic kind of macro-trendlines in the relationship between the agricultural economy and the industrial economy, and pointed that out and said, this is agriculture adjustment. Never mind a policy saying we're going to adjust agriculture; the

adjustment is happening. I think the question for you and for other economists at Chicago was how you manage to deal with that adjustment that's taking place. So in NC State, you had a number of students there that were helping you on these projects. You talked about graduate students as extensions of yourself to some degree, right? You've got so many projects in your mind, so many things that you're curious about, and having a large number of graduate students is important to you to be able to undertake all of those projects. But you're also helping them, right?

03-00:14:33
Tolley: I hope so.

Burnett: So in other words, it's not uncommon in the sciences and the social sciences for anonymous contributions to the greatness of a leading professor in a discipline to be the price of admittance to the profession. So there are cases in which graduate students do not get the credit that they deserve. I think what's interesting about your model, your pattern, is the way in which you put the students almost on the same level as you. You're a co-editor of a volume and you're a co-author of a paper. Can you talk about that approach, where that comes from, why you take that approach? It's not always done that way, is what I would suggest. So can you talk about your approach to working with students, mentoring them, and how you view them?

03-00:15:48
Tolley: Well, I think it was just idealistic. I wanted to bend over backwards, which I did, to make sure that they got credit. There are many cases where, frankly, I was really the senior author, but in many cases I made them the senior author to help them out. That's my role as a professor, to help in bringing people along, help them in their careers. So it was just personal taste. Idealism, really.

Burnett: It's just kind of your idiosyncratic approach, or were there models for that kind of behavior? Did you see that being done? Because when you talk later about Chicago, you are kind of in a class by yourself, when it comes to advising. At least during key periods, you're advising up to—I think at one point it was twenty. Did you have twenty graduate students at one point?

03-00:16:51
Tolley: Well—

Burnett: That was a number that came out in some of the background interviews.

03-00:17:01
Tolley: In Raleigh, there was the experiment station and all of that, and there were just a lot of research funds around, so they could afford it. Then when I got to Chicago, I went through a period where I had a lot of federal grants, where I had more money than most faculty members had. I think most faculty members were not interested. It took a toll on me, in a certain extent, because I had to work with them. I don't know whether it was a toll or not. Anyhow,

that was why I was able to work with these graduate students, because I could get the funding support for them.

Burnett: Right. Well, it's real project management, isn't it? So that's another indirect—and this was mentioned—there's a kind of indirect benefit to watching you manage students. So some of these people, as they went on to become professors themselves, they also had graduate students. So that's a skill, learning how to manage projects, to keep juggling a number of these projects in the air. And some of them went on to managerial positions in the federal government and these other places. They learned their management chops from you.

03-00:18:37
Tolley: I hope so, yes.

Burnett: That's kind of an interesting, inadvertent side effect of this kind of productivity of yours that was bringing people in, bringing people together. So the theme of those years at NC State was, disaggregate the farm problem, think about it in different ways. What are the ways in which farms are changing? The size of farms is changing.

03-00:19:14
Tolley: Very definitely.

Burnett: Right. The farmer, the demographics of the farmer is changing.

03-00:19:24
Tolley: All of that, of course. The technology that you were mentioning—. I remember going to those farms—I think they were in New York, the dairy farms—and they were not huge in land, but huge in number of cows and the mechanization of the milking process and the storage process and so forth. It was quite astounding to me, frankly. I don't think it was generally recognized how rapidly this was going on.

Burnett: The rise of agribusiness.

03-00:20:01
Tolley: Well, no, these were farmers who were adopting. I think out in wheat country and corn country, the farms were getting bigger in acreage. The dairy farms were getting bigger in machinery and that kind of thing.

Burnett: Right, becoming much more capital-intensive.

03-00:20:21
Tolley: Right.

Burnett: Much more scientific in their approach too, because you can't just throw a bunch of machines at things; you have to understand how everything fits together.

03-00:20:32

Tolley: Right. Of course, for the cows, they have these milking machines. Before you had them, you had to do it by hand. But then they got more and more sophisticated. They can bring in two or three hundred cows and milk them all at once. Amazing.

Burnett: So it's labor-efficient. So it does enable the perpetuation of the family farm. You can still do it. It can be this capital-intensive system that still has a family-rooted labor system. It's the kids who are out; but the kids are now managing this milking system, really. In and around NC State, there's tobacco country and the farms are changing, to some degree. But I think one of the things you noted, as I said earlier, is that the farm education, or agricultural education, is not keeping up with the changes. I think that's one of the things you suggested needed to take place. You had mentioned that with respect to agricultural economics, the need to become more mathematically sophisticated. But in terms of the human capital element, there needed to be a great investment. We've been talking about human capital a lot, but we haven't really talked about the origins of this term and the people that were involved. Can you talk about what human capital means historically, how it enters the profession and who's involved? What are the consequences of having human capital as an economic concept to think about economic problems?

03-00:22:35

Tolley: Well of course, now we're talking about Gary Becker and Ted Schultz. They're the people who wrote human capital into the economics profession. I was there and I said, "Yes, of course, that's true." Then in Raleigh, Ed Bishop was very much on the education front, and the Ag Policy Institute was pushing that very much. I was working—I think we talked a little bit about this—I was working on the economic development of the mountain area of North Carolina, Asheville and so forth. We stressed the importance of education to the economic development of that. I think in Raleigh, through the Ag Policy Institute, it brought in this emphasis on education that had not been there before.

Burnett: Yeah. It seemed to kind of emerge from Schultz's experience with his witnessing of the changes in the agricultural economy. He could see the difference that the Land Grant colleges made in the nature of farming; that innovations had to be brought to people, and they had to be adopted to be effective. But that investment yielded dividends. I think Zvi Griliches got in on that, as well, trying to show that there's a return on investment, in terms of education.

03-00:24:08

Tolley: No question.

Burnett: Schultz was, of course, a real champion in investment in education and that being a factor in the economy.

03-00:24:15
Tolley: Well, so I certainly, when I went to Raleigh and began working with the graduate students—. They had this work ethic. They felt if they just worked hard enough on something, they would solve the problem. I just had to say, "That's all very well, but you better think about what you're doing."

Burnett: So if they put their minds to it, they were going to—. We're going to fix this thorny question that's been vexing people for decades.

03-00:24:45
Tolley: Yes.

Burnett: Yeah, that sounds like a graduate student spirit, I think.

03-00:24:52
Tolley: Right.

Burnett: So I think maybe at this point, I want to twin this, because I'm interested in the agricultural economics group at Chicago, that comes out of Chicago and goes to places like NC State. Their interest in the domestic farm problem in the United States, and increasing attention that's paid to international development and the problems of international development. Theodore Schultz begins writing about this. In a sense, he was in on the ground floor of economic development during World War II. He was looking at the maize program in Mexico and so on. Then on up through into the sixties, with transforming traditional agriculture, which becomes a huge tome in the economic development community. D. Gale Johnson is another figure who is really deeply invested in international development and understanding those problems. We've talked about T. W. Schultz a fair bit. Can you talk about D. Gale Johnson? Can we get a sense of your perspective on his contribution to these fields, both the domestic ag policy and international trade policy and international development? What were some of the things that really animated him as a scholar, that you remember?

03-00:26:45
Tolley: I may be too close to it. Everything you're saying is true. I shared an office with him for years.

Burnett: You did?

03-00:26:55
Tolley: Oh, yeah. There were three of us in agriculture. Ted was in one office, and then Gale and I were right next door in the other office.

Burnett: So there was a physical colocation of the agriculture people.

03-00:27:09
Tolley: Oh, yeah. Oh, yes.

Burnett: Okay. Who else was in that? So you were the basic core?

03-00:27:16
Tolley: Yeah.

Burnett: Were there others who were situated in close proximity?

03-00:27:23
Tolley: Not really. I know when I was a graduate student, I was talking about the Lorado Taft house on the other side of the Midway, which was an old house, and a wonderful experience for a graduate student because you learned from each other so much. I don't know how long that went on. I was not aware that most of the others—we were the only faculty that was in that group. I know for a while, there would be visitors from the USDA. I don't know where they were housed, but not there.

Burnett: Right.

03-00:28:03
Tolley: So we were there on the fourth floor of the social science building, in the middle of the economics department.

Burnett: In the middle of the economics department. And USDA economists would come to do research projects, or they would come on a consultative basis? Or both, probably.

03-00:28:22
Tolley: They were probably doing their own research; I really don't know. I would talk with them, but they would come in and talk with Gale and Ted and I don't know how long that went on, but they were they were well known in the USDA, of course.

Burnett: Right. So from what I can piece together, I think D. Gale Johnson had a longstanding interest in Soviet agriculture.

03-00:28:54
Tolley: Yes, and he worked with Arcadius Kahan. Have you run across that name?

Burnett: Yeah.

03-00:28:59
Tolley: Arcadius, that was his specialty, the Soviet [Union]. I know that then when things opened up, Gale [Johnson] went to the Iron Curtain countries, and would come back and describe their economies. He was very good about that. You could ride from Moscow to St. Petersburg for a nickel. Things like [that].

Burnett: Now, that's a subsidy, right?

03-00:29:27
Tolley: Yeah, a little bit.

Burnett: But I think he was quite shocked by the way the agriculture was done in the Soviet Union.

03-00:29:4
Tolley: Oh, yeah.

Burnett: And quite surprised by it, and was of the opinion that it wasn't going to last. So that's a kind of interesting Chicago story, as well, something that George Shultz takes into consideration. He wasn't quite sure where that knowledge came from. I think from his own travels. He said that he actually asked the CIA to do studies of this.

03-00:30:11
Tolley: Yeah, I think he and Arcadius were working for the CIA, probably. They never said as much, but somehow I got that impression.

Burnett: Right. So he understood that this very mighty and somewhat menacing military power was actually, of course, marching on its stomach, and it wasn't doing too well on the agricultural front. It's something he took in as an ace in the hole, when it came to negotiating with the Soviets.

03-00:30:49
Tolley: Possibly.

Burnett: So that was a really interesting dimension to the Chicago understanding of what, in effect, was a cold war in agriculture. I don't want to make it too dramatic, but what people recommended for agriculture was political. I think that's a fair thing to say. Even though a Chicago economist would say, this is what the data tell me about what we need to do or what is happening in the economy, they're saying that in a political world in which the recommendations people make about a country have to do with ideas about the relationship of that country to other countries, the history. So for example, when P. T. [Peter Thomas] Bauer, in the fifties and sixties, was saying these newly liberated post-colonial economies should specialize in their area of comparative advantage, what a lot of folks heard from that was, you want us to be hewers of wood and drawers of water for the colonial powers, basically. It's a neocolonial position.

03-00:32:15
Tolley: Mm-hm.

Burnett: So making policy recommendations in that context was challenging. What do you remember from those times, from the sixties? There's a lot of political turmoil in the world, going into the seventies. Can you tell me about how economic development was political or politicized? How did you encounter that?

03-00:32:48
Tolley: Well, in academic discussion, the main thing—I think we were talking a little bit about it before, and I'm sure you have encountered it even more than I—that there was this school of thought that a country should industrialize to develop. The Chicago tradition, I certainly came out on the side where you look at the Asian tigers and it's just the opposite. They didn't protect anything; they opened it all up. If anything, they subsidized their [exports]. I know when I was Korea, I was very interested in this. They did a study and they said that Korea was losing money on every dollar of its exports. Can't have been true. But anyway, it was definitely export oriented, and that's how they developed. So that kind of proved it empirically.

Burnett: Yeah. I guess the phrase is export-led growth?

03-00:33:59
Tolley: Yeah, right.

Burnett: But it's tough to do in a democracy, because when you're able to sort of command the resources of the economy, you can say, we're going to focus on exports. There are other countries where they're saying, "wait a minute; we want to get our dividend from— We've just been liberated from the British or the French and we want to transform rapidly." The Soviet Union, at that time, is saying, we can help you out because we industrialized within a generation. So we leapfrogged all of the—. Don't buy that whole "you've got to do it gradually and you've got to take your time." That's what the colonial powers are always telling you, "wait another couple hundred years and you'll be like us." The Soviets were saying, you can do it quickly. You should just follow us. So there was an urgency around development, wasn't there? There was a, we don't want to wait; we want to have it now. I think there was this push. Some development economists in the West were only too happy to oblige. They felt like this was an intellectual cold war, so Walt Whitman Rostow had a stage theory for growth to match a Marxist stage theory. In fact, the subtitle for his book in 1959, '60, I guess, was *The Stages of* [*Economic*] *Growth: A Non-Communist Manifesto*.

03-00:35:39
Tolley: I see.

Burnett: Right? So there was an atmosphere of competition with the Soviets for the hearts and minds of the developing world, and that had to be kept in mind. Was that a conversation that ever happened amongst the agricultural group at Chicago? Or was it much more, "we're scientists and we're just going to try to understand the problem as we see it?"

03-00:36:10
Tolley: Well, I can't remember where it came from. Of course, the Soviet agriculture collective system was a disaster. Then as I discovered later, if you look at the

statistics— I got very interested in growth; I don't know how much it shows up in my writings.

Burnett: Oh, yeah.

03-00:36:34
Tolley: But in any case, the Soviet Bloc countries, well, as we all know, they fell way behind. They were no real example of growth at all.

Burnett: Right.

03-00:36:52
Tolley: I only know the Korea story, which I know fairly well. The Koreas were separated. Incidentally, there was a lot of Communist sympathy in the south when I was in the embassy. Fletcher Riggs made sure I looked at all the old literature. Right after separation, there was a big effort to root out the Communists in the south. Then there was Syngman Rhee. He was the George Washington of South Korea.

Burnett: Right.

03-00:37:32
Tolley: But he didn't know how to manage anything. He let the price of rice get out of control. I don't want to get too far in the technicalities.

Burnett: Oh, no. Please do.

03-00:37:45
Tolley: Well, they said they're going to stabilize the price of rice. To do that, you have to store a lot of rice in the fall, when the harvest comes in. So they never knew that. They never knew how to store enough. So come March and April, they would run out of rice, and then there'd be these rice riots in Seoul and all the other cities. He was finally forced out. He had to flee the country. So then it was—remember Park [Park Chung Hee]?

Burnett: Yes, right. That's right.

03-00:38:21
Tolley: Anyhow, a military dictator came in. I don't know the politics of that. In any case, he said, "We're going to develop the country." It was US policy—"We're going to show that we can do better than North Korea." Which happened, of course. There was all kinds of economic development. I went over there at about that point—well, it was a little later; it was the late sixties; they were still working on this problem—to try to solve the rice price problem. But by that time, was it the extension system? There was the fertilizer, the new varieties were coming in. The Korean government was quite authoritarian. They would say, "Next month, you're going to put this many pounds of this kind of fertilizer on your rice." And everybody did it. So they had a lot of economic progress in agriculture. It's not the only thing they did, of course.

Then it was getting into export-led growth and so forth, and it was, of course, fantastically successful, in no small part, due to the fact that the Japanese had been there for a generation.

Burnett: At least, yeah.

03-00:40:15
Tolley: 1900.

Burnett: Is it 1890 to 19—? [Direct control from 1910 until 1945]

03-00:40:20
Tolley: I don't know. Anyhow, a long time.

Burnett: Yeah, yeah.

03-00:40:23
Tolley: The Koreans were always complaining about the Japanese, but then when push would come to shove they would say, "well now the Japanese did it like this." Actually, I've been working with somebody here, working on Chinese growth. He says that the British went into Egypt and they completely excluded the Egyptians from anything, even any economic decisions. The Japanese, cruel as they were, were far different. They involved the Koreans in all the modern techniques that they were using. So the Koreans were quite well primed to develop very much, because of that. So there's a whole history, of course, there.

Burnett: There is. Well, we all have our favorite examples of the countries that are successful and the ones that aren't. In South Korea, there's a kind of favored-nation status, with respect to the Cold War, so that South Korea had to succeed, in part because of its situation as the kind of "good twin" of the Communist north. The Vietnam War meant that the Korean economy was going to have a tremendous boost, because the US military effort was deeply, deeply based in Korea, and the Korean steel industry sort of comes into play as a result of that. So there are all these particular details that account for some of the success of the Korean economy—not to take anything away from the achievements. But this is what goes back and forth, isn't it? Because in this time period that you're talking about, when you're in Korea— Fletcher Riggs orchestrates that? Is that right?

03-00:42:51
Tolley: Well, I don't know how—Fletcher's the one who involved me. He was in Korea. I had worked with him closely on the TVA.

Burnett: Right, in the watershed planning piece, yeah, at the beginning of the sixties.

03-00:43:04
Tolley: Yes, right. We worked on the economic development of Western North Carolina. He was very involved in that, and I had a lot to do with the TVA's

activities during that period. But then he was in Korea. I guess he wanted to work on rice price policy, and explained I was the person who could do that. So through him, I was invited there. I went there several times and developed ways of—I think I did a lot of good, actually. I think they really didn't understand. In retrospect, it's pretty simple; it's a storable commodity. In the first place, you've got to let the price rise by the cost of storage, or nobody's going to store anything. So we went through all that. So then Fletcher was there. Then later, was Fletcher in Thailand? I went to Thailand to do the same kind of work. Then I went to Israel and Egypt, on the Camp David Accords. As a part of that, they fostered cooperation between the ag people in Israel and Egypt. They did that for a few years and then they sent in people to evaluate it. So there's a team of five or so people, and I was the economist; but there were agronomists and others. I did a fair amount of that kind of work.

Burnett: All under the auspices of USAID, Agency for International Development?

03-00:45:04
Tolley: Almost all of it, yeah.

Burnett: Yeah, yeah. So that's in the seventies, right? I think it's '71 to Camp David, at the end of the seventies. So that must've been fascinating to see.

03-00:45:19
Tolley: Yes, it was.

Burnett: So the Israelis make the desert bloom, capital-intensive, input-intensive agriculture and that being transplanted as kind of one of the peace-making gestures of good will.

03-00:45:35
Tolley: I learned so much about economic development in all of this, certainly. I remember we landed in Egypt, to start out with. They spent the first day taking us to restaurants. They didn't have any notion of really getting down to work. Get over to Israel, they get to right to work. Everything is work. Quite a contrast.

Burnett: Well, I suppose there's a tradition of hospitality.

03-00:46:05
Tolley: Oh, yes. It's probably that.

Burnett: There's a way of doing things before you get down to business that's important. So you had these experiences. You also encountered that different worldview. I know that Arnold Harberger knew and was buddies with Andre Gunder Frank way back in the fifties, in the early fifties, I guess, '54, something like that. Andre Gunder Frank was a graduate student in Arnold Harberger's workshop. He talks about that. You knew Andre Gunder Frank, is that right?

03-00:46:48
Tolley: Yes, I did.

Burnett: Can you talk a little bit about him? Because he was a student at the University of Chicago, and this absolutely fascinating, because he's a huge figure in the discipline of history. He became a huge world historian. So I'm interested to know—The University of Chicago economics department is probably the last place I would've associated Andre Gunder Frank with.

03-00:47:16
Tolley: Yes, so his father was a famous novelist, and he wrote a novel about two people that were prisoners of war during World War I. I guess Andre Gunder is Jewish. Anyhow, his father was Jewish. So did his father escape? Gunder came to Detroit and went to high school, I think in Detroit, Michigan somewhere. Then he ended up here. He came here to do work and was working in economics. I, frankly, probably knew Gunder much better than Al, because he was a personal friend. Gunder was a very vocal person. So Ted Schultz says, "Gunder Frank is not an economist; he's an anthropologist. He's not interested in economics at all." Then he went to Chile and was involved in that. I don't know how much you know about him. He escaped with his life, though, in the revolution, when—I'm calling him a dictator—took over.

Burnett: [Augusto] Pinochet.

03-00:49:00
Tolley: Yeah, right. So he went down there and went to Latin America. I know that when I was in Raleigh— This is a classic story. Anyway, about nine o'clock at night, two men in trench coats came in and asked me all kinds of circuitous questions about Andre Gunder Frank. They, of course, were from the FBI, trying to investigate him. Then I saw Gunder once, and then he was in Canada. I did get the impression; I didn't really follow his work. I saw a few quotes and I could see he was quite leftist. So then he died not too long [ago], or a few years ago.

Burnett: 2005, I think. It's interesting, yeah. At a certain point, he becomes persona non grata in the United States. I think they take away his passport, actually.

03-00:50:12
Tolley: Oh, yeah.

Burnett: He couldn't go back to the United States, so he was in Europe. I think that's right, if I'm not mistaken.

03-00:50:18
Tolley: He was in Holland for a while. I know he had an appointment there.

Burnett: Yeah, yeah. He was persona non grata; no one would hire him in the United States. So he was kind of blacklisted.

03-00:50:28
Tolley: He was here. I saw him in Chicago once, fairly late in the game.

Burnett: Yeah. So maybe this was kind of a temporary situation.

03-00:50:37
Tolley: Well, he was in Canada, at that time.

Burnett: Okay. Oh, he was able to visit.

03-00:50:41
Tolley: Yeah.

Burnett: Okay. Okay. Well, in '67, he writes about the economic underdevelopment of Latin America in *Capitalism and Underdevelopment* and *Latin America: Historical Studies of Chile and Brazil*. So it's kind of dramatic, because there's Al Harberger in charge of the fostering of what Al calls "good economics" in Latin America and training folks there, and they go back and produce a policy road map that gets then adopted by the Pinochet regime. And there's Andre Gunder Frank, who has friends on the other side. It's quite a dramatic story. In addition to it being a dramatic story, the reason I asked is that I wanted to see what you knew about that framework or that way of understanding things. In other words, that there's a colonial or quasi-colonial history to the relationships between powerful industrialized countries and erstwhile empires and either colonies or former colonies; or in the case of Latin America countries, they have a kind of quasi-colonial relationship with the United States; and that that structurally changed the economies of those countries. And according to that framework, you needed to have a different approach to thinking about development. That also, I think, partakes of a particular Latin American understanding of development, through Raúl Prebisch and the Economic Commission for Latin America. So protection is going to be an initial stage, keeping the industrialized West out of these countries. So is that a narrative that you encountered? Were you aware of it? Were you aware of your research being a counter to that?

03-00:52:58
Tolley: I knew Gunder very well. We had many friends in common. I was not aware of that. When he was a student here, he was not an ardent, outspoken leftist at all. Then when he went and worked for the regime down there, I realized. Then when I saw him once there, was that the last time I saw him? He said, "I've just been to the library and I'm counting up the references to my work." I realized that somehow this was very important to him. But honestly, he hadn't formed his opinions in such a hard way. I don't know what we talked about. He was just part of this student crowd, really. Actually, I was probably on the faculty at that time. I don't know how I got to know Gunder. Anyhow, I knew him very well.

Burnett: All this to say that there were differences of opinion in the world, in the academic world, about how best to go about economic development. Never mind a left-versus-right split; but there's also an Ivy League/Chicago split. So you have the modernization theorists—Talcott Parsons at Harvard, the Department of Social Relations; you have the Yale Council and the MIT Center for International Studies, and their leading lights, leading political scientists and economists there, who have a different view of economic development. I know from [T.W.] Schultz's papers that he was aware of Talcott Parsons. I think he has a folder on the department of social relations and he understood pattern variables and all of that kind of stuff. And obviously, didn't really much go in for it too much. He was interested in Sol Tax, for example, so he was open to other disciplines.

03-00:55:25
Tolley: No, I think Ted—. I know the name of Talcott Parsons very well, but I can't place why. I think it must've been through Ted's courses or something that he talked about.

Burnett: So I think he took some of these theories into consideration. But I think the history of these places, for an economist at Chicago, had to be black-boxed, to a certain extent. I think it's, "we're starting now, looking at the trends of the economic trends; we have to figure out what do to next." I don't know, is that a fair characterization of a kind of Chicago understanding of economic development?

03-00:56:20
Tolley: It probably is. I go back to American University. That is not my background. I am very interested in the history and the historical roots. But I think you're right; you don't find any of that in the Chicago approach. I think you put it better than I could.

Burnett: Well, we'll float that for now and we'll see where we land when we're—.

03-00:56:49
Tolley: Okay.

Burnett: We'll let that sit for a while and percolate. Let's jump ahead and then we'll come back. Let's jump ahead to 1973. Maybe it's '72, actually. The publication is '73, '74. But you put together a seminar on agriculture, trade, and development. You bring together a lot of great Chicago folks, scholars in agricultural economics and so forth. There are a number of essays that were written. I think the structure and the order of the articles is significant. I don't know what you remember from this project. Can you tell me a little bit about why you undertook that project?

03-00:58:11
Tolley: I don't remember.

Burnett: That's okay. I think it's the same year D. Gale Johnson publishes *World Agriculture in Disarray*, which is a famous text of his, where he's making a push for having a better system of a freer trade in agriculture. I think he did a lot of analysis of the gains to be had from freer tradition in agriculture, that there's something anti-development about our international trade policy, with respect to agriculture. We're providing a lot of food aid to these countries, but we're also retarding their market development. The articles seem to be part of an integrated argument. So there are essays on India, on countries in Southeast Asia, but also Taiwan and South Korea. So there's an article by John Mellor and Uma Lele called "The Interaction of Growth Strategy, Agriculture, and Foreign Trade: The Case of India." It looks at textile exports between 1953 and '68. In 1953, India was pretty dominant among all the lesser-developed countries. It was producing 58 percent of all textile exports. By 1968, India had increased its exports only by $4 million; but the other LDCs together had increased their exports by $2 billion. So India's share of exports among those countries had gone from 58 percent in 1953 to 8 percent in 1968. Whereas Taiwan and South Korea's exports in textiles were one-third larger. So the conclusion to that article is—I'm quoting—"India's problem was not market dominance," meaning that it was already dominant and that was something that accounts for its low increase. "India's problem was not market dominance or lack of foreign markets, but failure to produce; which in turn, was due to lack of market orientation, failure to modernize, and failure to import raw materials." So that's the article on India. The next two chapters, "Economic Development in Taiwan," by Anthony Tang and Quo Shu Liang, and your article on "Growth, Capital Import, and Agriculture in Korea." So I'm wondering, is there a case being made in this volume, at that time in history when there are these arguments about infant-industry protection? Because India was famous at this time, right, for a highly protectionist agricultural policy. Even though it was this Green Revolution, it was awash in food aid that had complicated economic impacts on its economy. It's an era of kind of a protection of the agricultural sector. Is there a kind of argument being made about a failed case of development, or a slower case of development, and more rapid and successful cases of development, with respect to agriculture?

03-01:02:03

Tolley: From what you're saying, it sounds like it to me.

Burnett: I don't want to sell you on it, necessarily. It may just have been happenstance that Fletcher Riggs asks you to go to Korea and you discover that this is happening in Korea, and it's interesting to you and you influence their agricultural policy for the better. But it's one of the first instances that I can find in the history of international development that contrasts what become the Asian Tigers with the absolute central foci of industrial development, which is India and some of the other notable lesser-developed countries. So if you look from a distance at Chicago, the Chicago agricultural group, and you look at the human capital side of the training of economists in Chile, you're looking at almost these experimental interventions and experimental research

projects in these countries that are taking a different path from the dominant development path that everyone else is paying attention to, looking at the Green Revolution and all of this that's taking place. Certainly, Schultz was exploring India and was really looking at India for a lot of his development work. So it's kind of an early exploration of that. Down the road, in the eighties, people are talking about the Asian Tigers. People are talking about this; this is this other path. The Chicago-school development folks, who are by then in the World Bank and in all these international financial institutions, they're saying, look at this path. I'm wondering if it doesn't start with that book—it couldn't be too much earlier— where people were considering these other examples of economic development.

03-01:04:34

Tolley: It could be. It sounds reasonable to me.

Burnett: It's plausible? We'll put a provisional pin in that and we'll revisit that later. We're not done with international development, because it comes up again in your career. This is something you're interested in, and students of yours take that path, and you end up working with the World Bank, so we'll cover those in later sessions. Coming back now to NC State again, in those early sixties years you're doing all this work on observing the transformations, plural, in the US agricultural sector. You're doing some consulting and some participation on committees. I wanted to ask if there is anything significant about it. If you don't remember, that's fine. I think someone with a résumé your size, there's going to be things that are less relevant than others. The Farm Foundation. Between 1961 and '63, there was a national study group on benefits and costs of government programs, and you were part of that group. You said last session that you were going to the Farm Foundation on a regular basis. Was that that period that you were talking about?

03-01:05:54

Tolley: That was one of the subjects. I think I mentioned the Farm Foundation on other subjects, too. But yes, I do remember that. There was somebody named Larry Tombaugh. He's a forester. He was with the National Science Foundation. The National Science Foundation was just getting going. And he was looking for somebody who would break through on the environment, if you will. I think Larry was at those meetings. But that's about all I remember. Then he was responsible for the funding of Chicago and Argonne in environmental pollutants of the urban economy, where we really dug into all these environmental problems.

Burnett: Okay. I think of the Farm Foundation as having this focus on ag policy reform.

03-01:07:04

Tolley: Right.

Burnett: But it's interesting that there's a circulation of foundation folks who are also associated with these organizations, and it's an opportunity for you to meet these folks. You learned about a new orientation of the National Science Foundation, to deal with natural resource problems, urban pollution, that kind of thing. Were those the conversations in the early sixties?

03-01:07:35
Tolley: It must've been. Also I think that— How did I hook up with Argonne? Was it through—? Frankly, I think Larry Tombaugh was looking me over at these meetings and getting to know me.

Burnett: Okay.

03-01:07:51
Tolley: Then was he the one who put us in touch— Then I started working with Argonne, and the NSF funded the University of Chicago and Argonne jointly. That's when they had the air pollution models and we brought the benefit-cost analysis to bear.

Burnett: Goodness.

03-01:08:13
Tolley: Working on how to clean up Chicago.

Burnett: Right. So in the timeline, in terms of the public imagination, there's Rachel Carson's *Silent Spring*, which is a book that ends up on everybody's coffee table. Is it 1961 or '2? It sounds to me that there were increasing concerns with resource use and pollution that was coming through. So there was, at an institutional level, in terms of the research foundations and even the Land Grant colleges, there was an interest in understanding the consequences of pollution, even prior to that. It brings it up in the public imagination in the sixties, and that leads to all of the environmental awareness and so on. But there was a kind of environmental orientation in the fifties as well, right?

03-01:09:41
Tolley: My understanding of the history is probably superficial. In about 1960, the federal government started this air-shed approach, like the Chicago metropolitan area was an air shed, and they were given the power to control air pollution in the Chicago metropolitan area. They tried that; it didn't work. They couldn't cooperate. So then as I understand it, when Nixon became president, one day he said, "I sense the American people want to do something about the environment." So the Clean Air Act of 1972 or whenever it was, was passed. Then that was the impetus, when the EPA was formed.

Burnett: Right, yeah.

03-01:10:38
Tolley: That was the impetus for that serious discussion of the environment.

Burnett: Right. But just to keep track of things a little bit, in terms of your participation and engagement in things, you're also a member of the Social Science Research Council Committee on Agricultural Economics from '61 to '65. Is that when you're doing the surveys of the field? Was that part of that work?

03-01:11:07
Tolley: No, it was not. That was strictly a Raleigh, North Carolina deal, financed by the experiment station, and they were very generous to me. But they go all over the country to survey. We met in New York; those were very nice meetings. I honestly don't remember. It was more just that they, like the Farm Foundation, were very interested in enlivening agricultural economics, particularly in the Land Grant colleges. So they would bring together promising people from the Land Grant colleges. I honestly don't remember the agendas.

Burnett: But this would've been the Social Science Research Council.

03-01:12:05
Tolley: Yeah, but it still was on agriculture.

Burnett: Okay. But it wasn't connected to the Farm Foundation at all.

03-01:12:10
Tolley: I don't believe so.

Burnett: Okay. I'm wondering, then, if that has anything to do, just because it's a national council and agricultural economics, that you become vice president of the Agricultural Economics Association—I guess it's the Farm Economics Association at that time—in '65, '66. Is that right?

03-01:12:38
Tolley: It's probably right; I don't know the dates.

Burnett: Yeah. So the vice president. Did you have responsibilities for the national organization? Were there things that you had to do for—?

03-01:12:48
Tolley: Not a heavy responsibility.

Burnett: Okay. You did some consulting work while you were at NC State. I'm curious if this rings any bells. In 1964, you're a consultant for the Civil Rights Commission.

03-01:13:13
Tolley: Well, what does it say?

Burnett: That's all it says. I wish I could help you out more than that. I'm wondering if it's about rural poverty, because the following year you're a consultant for the Appalachia Commission. So I'm thinking if this, the interest in rural poverty,

is of national concern. In fact, you're a consultant in '67—this is after you're gone from NC State—but you're on the President's Commission on Rural Poverty, or at least a consultant for it. I don't know if they just reached out to you and you maybe sent them a memo or something, but maybe that was the level of involvement. All this to say that it sounds like you're on the radar of institutions that are concerned with rural poverty; that this is an area of expertise that indirectly you've cultivated by trying to disaggregate the farm problem into these kind of demographic constituents that are faring differently under the new economy in agriculture.

03-01:14:22
Tolley: Okay, this brings us to my going to Washington, to the USDA, which was in '64 or '65.

Burnett: '65.

03-01:14:30
Tolley: '65.

Burnett: Yeah, the same— Yeah.

03-01:14:34
Tolley: So that was Lyndon Johnson, the War on Poverty.

Burnett: Right.

03-01:14:49
Tolley: I was asked to come to Washington. Did you ever run across the name of John [A.] Schnittker?

Burnett: John Schnittker? No.

03-01:15:01
Tolley: I think he was Undersecretary of Agriculture. Anyhow, there was Lyndon Johnson and the War on Poverty, and there was something called the OEO, the Office of Economic Opportunity. That was the over-arching agency on poverty. Then they wanted to do something about rural poverty. So here was ERS [Economic Research Service of the US Department of Agriculture], which was the descendant of the BAE, and I was asked to—they reorganized ERS, and they brought together, actually, those old divisions, or sections, whatever they were called, from the BAE that were concerned with the welfare of low-income rural people. They called that the Economic Development Division, and they made me the head of that. So I spent the next one or two years, I forget, there. That's how I got much more deeply into that. The old BAE was there. I had been in my father's office for a while when I was in high school. The old sections were there; some of the same people were there.

Burnett: Really?

03-01:16:47
Tolley: Yes. Actually, I remember then they were going to congress for their appropriations. I was pointedly not asked to go, because—.

Burnett: They would know the name, wouldn't they?

03-01:17:00
Tolley: Yes, right. Those people were still there.

Burnett: They were still there! Oh, my goodness. That is amazing. So T.W. Schultz was outraged when the BAE was dismantled. He wrote I think it's like an open letter to the profession, in the *Journal of Farm Economics*. A colleague-friend of his, Charles Hardin—

03-01:17:37
Tolley: Sure.

Burnett: —I think he was in political science. Did you know him?

03-01:17:39
Tolley: Yes, he was in the political science department at Chicago. He used to come to the workshops. I don't know whatever happened to him.

Burnett: Yes. He was deeply interested in agriculture. So he wrote an article in '46 about what was happening to the BAE and what the cuts were in appropriations for economic research, and called it out as a political operation; that this was some plantation-owning congressmen or people who were beholden to plantation owners, who didn't want anyone sniffing around their operations. Schultz was livid when they finally dismantled the BAE in '53, and it had already been cut to the bone. So he and Hardin knew each other and they were following this, and he just laid into them, "This is going to put back research in agriculture, decades." The basic position of both of them was–I think you mentioned that, and this is also true—that the rural sociologists were looking at the racial inequality aspects in one particular county, and a congressman got up in congress and said, "You're smearing the good name of the people of this county." Schultz was arguing that the kind of research that they were preventing was no different from the research that was collected by the Bureau of Labor Statistics. This is just employment information. It's data. And without data, there can be no policy of any kind, whether it's considered to be left wing or right wing. So as a scientist, he was outraged that this had taken place. So the BAE is dismantled in '53 and the functions are split between the AMS, the Agricultural Marketing Service, and the ERS, [which] was the Economic Research Service. The lesson that was conveyed to those who survived all of that was, just gather statistics on crops and keep your nose clean. That's legendary in the USDA as a kind of—they were really silenced and they were prevented from doing what they saw was their job. How do you feel about that, given there's almost a kind of a redemptive quality to that? You didn't want to become an agricultural economist. You tried not to be an

agricultural economist. I understand why, in part. But you did, and T.W. Schultz was maybe right, that it was in your bones. There you are twenty years later, and you are asked to be head of Economic Development, which is a kind of revival of this research. What was your response to that?

03-01:21:22
Tolley: Well, I was gratified. By that time, I was completely sucked in. My reputation as an economist had grown tremendously by that time. So I felt fine about it. I know that John, he came to Raleigh and give a talk or something.

Burnett: This is John Schnittker.

03-01:21:48
Tolley: Yes. I had him over afterward and we were talking, and I could tell, as a result of that conversation, he invited me to Washington to do that. I think he felt it was poetic justice, too, completely.

Burnett: That's fantastic. I find it fascinating that they asked you not to go to that [testify before Congress]. That's really interesting. So you go to Washington again. But this time, as a functionary.

03-01:22:28
Tolley: That's right.

Burnett: Which is something you had considered, right? You had considered as a young student and a young man; this is something you had thought you were going to do.

03-01:22:39
Tolley: Right. Yes, well, my father was a civil servant, all our friends were civil servants, so I guess I thought I wanted it.

Burnett: When you went there, you actually had the same offices? It was in the same place in the USDA building?

03-01:22:58
Tolley: At that time, it was, in the south building. I don't know if you know, there's the main building and then there's the south building. It's huge; I think it's probably a two-square-block area. At the time, it was the largest office building anywhere, because agriculture, of course, was such a huge thing.

Burnett: Yes, It's still an impressive building, after all this time. So you install yourself there. Can you talk about what impact that had, being now a member of the US Department of Agriculture, seeing things from that side? Did that have an impact on you, on your understanding of policy making and data gathering from a government perspective, as opposed to an economist with a private university?

03-01:23:58
Tolley: I think I probably already knew quite a bit about that. When I was at Raleigh, I did a lot of work on migration. At that time, they had some really excellent demographers there, so I kind of knew. Then in Raleigh, they have people from the USDA stationed there. Having grown up there, I kind of knew quite a bit about that. Some of the people who worked with my father were still there.

Burnett: Really?

03-01:24:33
Tolley: Yes.

Burnett: Wow. It was a new environment. And now, from the very top, there was a directive to understand, to learn more about poverty, and to learn more about rural poverty. So you were called to do that work.

03-01:24:56
Tolley: Yes. I remember being on a taskforce on rural poverty. There were about ten of us working long hours. And then late on a Saturday evening, we finished up our report. They took it from us and they said, "You can't see this. It's classified."

Burnett: The thing that you produced is classified.

03-01:25:19
Tolley: Yeah. We couldn't see it.

Burnett: You can't know anything about it, even though you wrote it. So there was a taskforce. You had the resources of the USDA. Was that a different experience, in the sense that was there—? You had demographers. Did they have computing power at their disposal? Was that changing by the mid-1960s? Were they running analyses?

03-01:25:52
Tolley: Oh, quite a bit. When I was a graduate student, I had wanted to run a regression with six variables. It took me a week to do it. Then I remember I was working with a graduate student in Raleigh. He said, "I was shaving this morning and I thought of fifty regressions. Here are the results." At that time, I knew something was different.

Burnett: Right. So he got some time on the mainframe and was able to—

03-01:26:20
Tolley: Yeah, that's right.

Burnett: —just have it spit out? So it goes from Marchant machines, doing stuff by hand, like hand cranking this stuff out, to getting time on the mainframe, if you're at a major research university. We'll talk about that, I guess, when you

go to Chicago. I think that's also something that's different between the time that you were there as a student.

03-01:26:41
Tolley: Absolutely, yeah.

Burnett: We should talk about computing at Chicago and how that changes. So you had, I think, a full year there at the Economic Research Service.

03-01:26:53
Tolley: Yes.

Burnett: Were there any lessons? You said you were already familiar with it. Were there any lessons that you took away from it that helped you think about agricultural policy in a new light, or was it something you were already—not agricultural policy, but sociological investigation, demographic investigations—that you took away from that experience?

03-01:27:15
Tolley: Well, I learned a lot from it. One project that I got involved in, we did a volume called *Rural People in the American Economy* [Washington, DC: Economic Research Service, USDA, 1966]. I wish I had a copy of that. Anyhow, we put together a lot of information on the welfare of rural people and what they do. I remember that being a big effort. Then I was working with the people from the main OEO, Office of Economic Opportunity, talking about the retraining programs.

Burnett: So this involved some of the manpower stuff that was being done with respect to retraining people for—?

03-01:28:04
Tolley: Yes.

Burnett: And the challenge of that.

03-01:28:09
Tolley: Yes.

Burnett: Something you mentioned in the articles that you were writing around that time, that there were sticky populations. There were populations that were less mobile. They're the older ones, they're the ones who are poorer, who are less likely to adopt new technologies, new things, and less likely to retrain. George Shultz ran into that issue at the national level. Six or seven years later, he's Secretary of Labor. That is a huge problem, of the very people who need it the most are the least able—and in some cases, the least willing—to undertake that training. They feel it's too late, that kind of thing. Automation is becoming increasingly a part of employment displacement, and so there's a real interest in training people up. To this day, right, this is something that's on

the table perennially; we need to keep ahead of the curve and try and train up, so that we can be continuously employed.

03-01:29:21
Tolley: Going back to North Carolina—it brings it back—we had a big interest in help. The community colleges were working with industry that was located in North Carolina. Anyhow, they would set up training programs so that when the plants came there, there would be a cadre of people who had the skills to do this. That was, as I say, in ag policy, North Carolina was very progressive at that time, interestingly enough.

Burnett: Well, yes. It becomes a center for new industries, doesn't it? And the university system, the Research Triangle, and all of that.

03-01:30:05
Tolley: Right.

Burnett: There's also a [T.W.] Schultz story there, too, because there's the Committee of the South, which is part of the National Planning Association. So this is immediately after World War II, in 1946, they're studying how to transform the South and how to attract industry down there. And human capital was part of it. In fact, in those days, I think in either '46 or '47, on the *University of Chicago Roundtable*, Schultz introduced Friedman, newly hired at the University of Chicago.

03-01:30:46
Tolley: Right.

Burnett: The phrase human capital comes up in that conversation. They talk about human capital being important in the postwar era. So even then, it was in the air. I'm not going to attribute it to either one of them, because it obviously morphs and is formulated by Schultz, and then Gary Becker after that. But this idea of the importance of the quality of people. Even Galbraith, who was part of the CED, the deliberations of the Committee for Economic Development, he was talking about the quality of employees, in terms of their training for war work. So it's a World War II/ postwar story of trying to adapt to a high-technology economy, and the South was a target of that development. So there's global development of lesser-developed countries and developing countries, and there's a conception of the South as an underdeveloped section that requires intervention. I think that's something that you were aware of, and you were participating in figuring out how to deal with populations that were left behind.

03-01:32:03
Tolley: Yes. I recall I worked, or we worked, with the Southern Regional Education Board there, that worked the universities. They were specializing, so there would be something of everything in the South.

Burnett: Was that the same thing as the coordination with the community colleges?

03-01:32:25
Tolley: No, it was different.

Burnett: Oh, it's a separate thing.

03-01:32:26
Tolley: Yes.

Burnett: So that there would be enough specialization so that you would have a ready, qualified population that could undertake work in the new industries.

03-01:32:38
Tolley: Right.

Burnett: Right. So you spend a year at the Economic Research Service, and you have that exposure to demography and looking at rural populations and the transformations of their fortunes and their opportunities. In 1965, you're a consultant for the Appalachia Commission. Can you talk about that and the kind of work that you were doing for that, as well? That would've been just before you went to the ERS; is that right?

03-01:33:17
Tolley: Well, I'm trying remember when it began. I knew some of the people in the [US Army] Corps of Engineers, which incidentally, for the most part, had been enemies because they tried to do all of this useless water resource development and wasted taxpayers money.

Burnett: Who thought they were useless?

03-01:33:47
Tolley: Well, we economists thought.

Burnett: Oh.

03-01:33:51
Tolley: That was one of the reasons for the appeal of benefit-cost analysis, because we could bring some numbers to bear on this and see what it's really doing.

Burnett: So in your view, it's the economists who were opposed to the Army Corps of Engineers folks, because of their wasteful, unsophisticated approach to project evaluation.

03-01:34:16
Tolley: Yes.

Burnett: You were bringing modern benefit-cost analysis.

03-01:34:19
Tolley: Yes.

Burnett: The story that I hear, or read from Ted [Theodore] Porter, is that economists with sophisticated operations-research training infiltrate the Corps of Engineers at the top level, and they're transforming it from within. Those are two different pictures.

03-01:34:44
Tolley: Yeah, that must be after my time. I don't think—

Burnett: Okay. So in the late fifties, early sixties, you were encountering an old guard and an old way of doing things.

03-01:34:55
Tolley: That's right. Actually, I'm trying to think. There were some economists in the Corps of Engineers. But they were miserable; they were second-class citizens. Nobody wanted to hear what they had to say.

Burnett: Interesting. Okay, so there's an institutional lag there.

03-01:35:12
Tolley: Right.

Burnett: Okay.

03-01:35:14
Tolley: But I think what we were doing, what I was doing, is the same thing that Al [Harberger] ended up doing with the World Bank, because the same thing happened there. Politics was rampant in these projects that he was looking at. People welcomed when he brought in some more objective analysis. So in any case, Charlie Levin, who was—he might've been at St. Louis, or was it Pittsburgh? How did he end up with those people? We might've worked with him in Raleigh a little bit. Anyway, they hired us jointly to study, what has been the impact of the Appalachian—? The Appalachian Regional Commission had been going about ten years or so by then. It began under—we went through this. Jack Kennedy went to West Virginia and defeated Hubert Humphrey. So when he became president, there was an Appalachian Regional Commission building roads and various things in Appalachia. So then they were going to evaluate it, and they hired Charlie Levin and me to do that. I got interested in regional economics, really, through that. It was rather important.

Burnett: Well, so you were hired to evaluate the ten-year— I guess it wasn't ten years, because—

03-01:36:59
Tolley: Couldn't have been quite ten years.

Burnett: Right, because it would've been '62 that Kennedy does the Appalachian thing?

03-01:37:10
Tolley: Yes.

Burnett: So it would've been just running for a couple of years, and you were brought in to sort of do a project evaluation of it, effectively.

03-01:37:18
Tolley: Right, yeah.

Burnett: Okay. But it stimulates yet another area of interest. Now you're just layering areas of interest that are intertwined, to some degree. So you're interested in populations; you're interested in resource bases; you're interested in regions. So there's a kind of geographic, almost ecological, demographic, economic, international web of relationships that you're interested in. That takes us up to the year that you're at the Economic Research Service, as the head of the Economic Development Division.

03-01:38:08
Tolley: Right.

Burnett: But you don't return to NC State, do you?

03-01:38:16
Tolley: No. I got the offer to go to Chicago while I was at USDA.

Burnett: Okay.

03-01:38:21
Tolley: So that's what I did then.

Burnett: Yes. Is it Al Harberger who went out to see you? Or do you remember how it went down?

03-01:38:33
Tolley: Well, of course, it was really Ted, but I think Al might've been— Was he chairman of the department at that point?

Burnett: I think so, yeah.

03-01:38:40
Tolley: Yes, so I certainly remember meeting with Al in Washington, where he was twisting my arm to come.

Burnett: Okay. So I think that's what Al remembers, is that he went out to recruit you.

03-01:38:54
Tolley: Yes.

Burnett: I think T. W. Schultz was about to retire. I mean he, quote/quote "retires" in 1967, but of course, stays around and is deeply involved in the department for many years after that.

03-01:39:11
Tolley: A long time, yes.

Burnett: So the answer is yes. You agree to join the department.

03-01:39:23
Tolley: Oh, yes.

Burnett: So how did that feel? Was that like coming home or—?

03-01:39:33
Tolley: Well, I felt that they were more intellectually stimulating. That was why I went there; that's why I decided that was a better place for me than Berkeley, even though Berkeley had a lot of attractions. But it was the intellectual stimulation.

Burnett: Had there been a standing offer when—? Because you did that year out visiting, '62-'63, at Berkeley. You spent a year with that group, and I think there was an agricultural group that you were working with there. Was there an offer made at that time?

03-01:40:23
Tolley: Not at that time. I think at that time, I was probably working with Ciriacy-Wantrup.

Burnett: Yes.

03-01:40:32
Tolley: He was a bit isolated from the rest of the department. He's a rather lone person.

Burnett: Right.

03-01:40:40
Tolley: He was respected. So at that time, '62, I was working with the Water Resources Center.

Burnett: Right, that's right.

03-01:40:54
Tolley: Then I went out in sixty-nine, '70? Something like that.

Burnett: That's right, yeah. So they made an offer then? They were trying to nab you then?

03-01:41:10
Tolley: We never got that far.

Burnett: Okay.

03-01:41:12
Tolley: It became clear that—

Burnett: Right. So you return to Chicago, and it's a different place from what it was in '55, when you left. Can you talk a little bit about your first impressions of the differences when you return?

03-01:41:46
Tolley: One, I more or less kept track of things in the interim, so it wasn't all that strange to me. But Bob [Robert] Mundell—the personnel had changed quite a bit—Mundell and Harry Johnson.

Burnett: Right.

03-01:42:12
Tolley: And then the Cowles people were gone.

Burnett: Yeah, that's right.

03-01:42:17
Tolley: The Cowles story, we can go into that. Milton came there, and began attracting all the students away from the Cowles Commission.

Burnett: Okay.

03-01:42:28
Tolley: That's kind of the basic reason, as I understand it, Cowles left.

Burnett: Really? Interesting. Yeah, I think there must've been maybe some personality— Yeah. So yeah, in '54 it goes to Yale, is that right?

03-01:42:58
Tolley: To Yale.

Burnett: Yes, but it was starting to shed a lot of its—as it goes to Yale, it loses a lot of the energy, the intellectual energy of the particular personalities, the intellectuals who were there. They off in their different [directions], disperse across different institutions.

03-01:43:20
Tolley: Right.

Burnett: So that's gone. But there's a new crew that have their own orientations to things. So George Stigler is there from '58 on. And Gary Becker.

03-01:43:46
Tolley: Gary had been there as a graduate? Yeah.

Burnett: Yeah.

03-01:43:50
Tolley: Then he went to Columbia.

Burnett: Yeah, that's right.

03-01:43:53
Tolley: He came after I came back, I think [Gary Becker, who graduated from the University of Chicago Economics Department in 1955, returned as a professor from 1968 until 2014].

Burnett: Oh, okay.

03-01:43:57
Tolley: I remember I seconded the nomination to make him an offer.

Burnett: Okay. But George Stigler is there and Milton Friedman's there. Milton Friedman, by that time, has become a public intellectual figure. He is writing accessible books, he's got columns in newspapers. That raises the profile of the department in a new way, right? It becomes more known publicly, and that just continues on into the 1970s, and further and beyond. He becomes a kind of advisor, senior advisor, to the new conservative movements in American politics. So he's, I understand, an advisor to Goldwater. You mentioned last session that he was saying, "What's wrong with Goldwater?"

03-01:45:03
Tolley: That's right.

Burnett: But he was an advisor to the Goldwater campaign, I understand.

03-01:45:09
Tolley: Well, he advised Reagan.

Burnett: Yeah, he did.

03-01:45:12
Tolley: In 1980, I guess.

Burnett: And in '76, I think.

03-01:45:18
Tolley: Well, no, it's probably seventy. Anyhow, I remember I called him up and I said, "Milton, what about the deficit? Reagan is saying the deficit doesn't matter." Milton said, "Yes, I told him that last week. That's absolutely right."

Burnett: So he could advise, but he wasn't necessarily followed.

03-01:45:40
Tolley: Right, that's right. Well, in that case, he was, of course. The deficit exploded under [Reagan].

Burnett: Yes, it sure did. So that has changed the landscape. Not for you, necessarily, but Chicago—I don't know. Let's make that a question. Is Chicago a different place because of that high profile? Does it become something different? Or is that really just Milton Friedman's thing and everyone else is just kind of doing their own.

03-01:46:16
Tolley: Well, times have changed. In the first place, Milton's monetary theory, in the fifties, it was not really taken seriously. The whole landscape has changed. The characters are changing. Harry Johnson, Bob Mundell, other people. Who's the economic historian? Bob [Aliber]. He's a well-known economic historian.

Burnett: Charles Kindleberger?

03-01:46:55
Tolley: No, he's more recent than that. He died a few years ago. Anyhow, the whole situation has changed.

Burnett: Yes.

03-01:47:08
Tolley: When in the fifties—and I think Ted had a lot to do with changing this—the department was paralyzed. They couldn't agree on a Keynesian to hire, and they were not making any hires. Actually, there was a period where we had to invited visiting professors in, just to fill the slots to teach. That finally got changed. I guess during the sixties is when that happened. I'm just guessing. During the seventies, probably.

Burnett: I think there's a memo in '54 or '56 that T. W. Schultz writes about the changing of the guard. Cowles has left, a bunch of retirements, like John Nef and a bunch of other people had retired or decamped, and they needed to revitalize. Arnold Harberger was part of that new crowd. So there had been new blood. You're saying that they couldn't agree on a Keynesian. Roughly when was that? That was when you weren't there?

03-01:48:23
Tolley: That's when I was there. That's why I ended up teaching all these courses; they couldn't get anybody else.

Burnett: Right. Okay. Did people feel they didn't want to hire a Keynesian at all?

03-01:48:36
Tolley: Well, I think so.

Burnett: Really? That's funny. So if they could avoid it, they'd just sort of kick it down the road.

03-01:48:44
Tolley: Yeah, yeah.

Burnett: Just maybe by then, we'll be able to change the economics profession so that we don't have to worry about that anymore?

03-01:48:52
Tolley: That would be my question at least.

Burnett: Yeah, that's interesting. So the department was developing new sets of questions. The agriculture and development side is continuing, largely because Schultz and D. Gale Johnson were there. D. Gale Johnson is younger, but not that much younger than Schultz. So was there a sense that we need to keep the agriculture-cum-development-cum-resource side going by hiring you?

03-01:49:45
Tolley: Oh, yes. I was invited back to work, actually, on the international side of things.

Burnett: Okay. So they wanted you to do more international development stuff.

03-01:49:56
Tolley: Yes, right.

Burnett: You did that edited volume in '73 that we were talking about at the beginning of this session, and that's part of that, right?

03-01:50:03
Tolley: Right.

Burnett: Okay. So you arrive there. Were there other things that you were appreciating when you landed in Chicago in the first couple of years you were there, '66, '67, '68, that were becoming apparent to you, that were an evolution for you as a scholar? Was it evident even then that you were thinking about new things?

03-01:50:39
Tolley: Yes. When I came back to Chicago in the late sixties, that's when urban problems were at the top of the national agenda, and it was very, very serious around here. The Social Science building was in the midst of it. I was teaching on the first floor, on 59th Street, and in Woodlawn, a low-income neighborhood across the Midway, people were burning down the houses to collect the insurance. It was so hard to teach because the sirens were going all afternoon. And then there was the student ferment, with the Vietnam War. I had been interested in the people from rural areas of North Carolina and other

southern states who were migrating to the center cities, and what they were doing. And here they were; I had just moved right in the middle of them.

Burnett: Right.

03-01:51:40
Tolley: The whole faculty was involved in how to handle the student anti-war sentiment and how to some extent the neighborhood black problem too. Then I had already done some relevant work. I'd done that one piece on the resident's site choice while I was still at Raleigh. So I was getting interested in urban problems anyway; but then the whole atmosphere here was such that it was a much more immediate thing.

Burnett: Yeah.

03-01:52:15
Tolley: I forget when I got into urban economics. I know the department was very good. I wanted to teach a course in urban economics, which were not a well-recognized subfield, and had to go before the department. Al was helpful and said the Chicago economy is bigger than most other nations in the world, so we better be looking about it. So that was all happening in that period. But I was still heavily involved in agriculture, too.

Burnett: Yes, but you're right that it is an extension of—if there was a Schultz plan, in terms of agricultural policy that he developed in the forties, he was really looking to the cities to solve a lot of the problems of inequality. I think he really believed that poor African Americans in the South would move to the cities and they would get better jobs, and they'd have a much better life than trying to deal with race relations in the South. It's like that's just a cauldron. But the people were marginal laborers, whether they were white or black, the people who had insecure sort of claims on the land, they were much more likely to leave, and they did much better. But the kind of heartbreaking side of that is that a generation later, you're looking at the other side of the equation. When people arrive in the city, they encounter segregation, lack of educational opportunity, racism, discrimination, all of that kind of stuff. You're following the kind of logic of the economic transformations of the United States.

03-01:54:16
Tolley: True.

Burnett: Well, that's maybe a good place for us to pause, to talk about the next phase of the George Tolley career, which is yet another layer of interest in a new feature that you're interested in in economics.

03-01:54:37
Tolley: Okay.

Interview 4: February 1, 2018

Burnett: This is Paul Burnett interviewing Dr. George Tolley for the Economist Life Stories project. This is our fourth session, and we're here in Hyde Park, Chicago. It is February 1, 2018. So Dr. Tolley, we were just starting to talk about your transition to the University of Chicago and the beginnings of your interest in urban economics and environmental economics. But I do want to ask you about a couple of articles that you wrote for *Econometrica*. Can you talk about *Econometrica* as a journal, the space that it occupies? It's the journal for econometrics, is that it? It's the journal of record for econometrics.

04-00:01:15
Tolley: Yes, right, it is.

Burnett: Okay. So I think one of the things that we could explore is a 1963 paper—so this is before you come to Chicago—"Consumer Demand Explained by Measurable Utility Changes." So I understand that this article explains some techniques that are a contribution to the field, so can you talk a little bit about it?

04-00:01:48
Tolley: Right. [Ray] Gieseman was a graduate student. He might've been my first graduate student at NC State, I don't know. Anyhow, it came out of that. So one of the precepts, if you will, of economic theory is that utility is not measurable; you can only have rankings, ordinal utility, not cardinal utility. Well, in the process of this work, we discovered that you can measure percentage changes in utility. That was what the contribution of this article was. I'm not going to go into the technique of how you do that because I'd have to reconstruct it. But anyhow, it was a contribution to the methodology in the field. Then also—I don't know if we mentioned it last time—that's probably the period when I was doing an article—I think that in *Econometrica*, too—"Reexamination of the Time Series Evidence on Food Demand," Vol.37, No.4, 1969. I think food demand was the empirical focus of the work with the measurement utility article was a theoretical article. I just wanted, for the record, that was a contribution to methodological—

Burnett: Did others take it up as a conversation about methodology?

04-00:03:26
Tolley: To some extent, but not as much as— It's very interesting and important theoretically, but it's not clear it has a lot of use. I think it probably does. I think it probably still could be taken up. But at the time, no.

Burnett: This is R. W. Gieseman? Is that how you pronounce the name?

04-00:03:48
Tolley: [he corrects the pronunciation] Ray Gieseman.

Burnett: Right. So there are several articles during this period that appear in *Econometrica*—"Agriculture and the Secular Position of the US Economy," which you talked about last session; and then there's a paper that's published after you arrive at Chicago. I'm assuming it's work that you were doing while you were at NC State. It's "The Supply of Farm Operators."

04-00:04:23
Tolley: Yeah, that was Warren Johnston. He was a graduate student at NC State, later went to [UC] Davis. So yes. That work was used, if you look in the *Study of US Agricultural Adjustments*, we used a lot of the empirical findings there. Anyhow, the methodological twist here, if you will, was the fact that it is very difficult to get accurate measures of income. So this is a way of teasing out the implicit income of farmers. So you get measures of how well off the farmers were, without actually getting dollar measures of their income. Then that was related to the fact of the migration and particularly of farm operators. It's low-wage selective, so it's the supply of farm operators, it's the age selectivity. But the methodological contribution there is to be able to infer the income, without actually having the measures of it.

Burnett: This appears in several articles, this sub-$10,000 a year of marketing sales and above $10,000 a year, and you calculate the averages for each of those groups. Was that an arbitrary cutoff, or did you look at the data set? Is that part of the methodology, is determining—you have to do some kind of statistical test to determine what is the right cutoff?

04-00:06:19
Tolley: I'm sure you do, but I do not recall.

Burnett: $10,000 sounds like a nice rough number.

04-00:06:26
Tolley: Right.

Burnett: You gave some picture to it, because I think you averaged the sales under $10,000 and it was like $2300 or something like that, on average, for all those operators; and then above $10,000 it was $33,000. So you got a sense, a tiny picture, of what the distribution was. But at any rate, I could see that argument popping up in a couple of articles. So there was a kind of larger project to tease out income, and then that was what was at stake here, was trying to get a sense of how you could measure this kind of income distribution without that knowledge. I don't know if you kept up with the transformation of ag economics past that time, but did they get much better data, either census data—? Did they get a much better understanding of the farm picture? Because we talked earlier about how the BAE was kind of shut down for a while, and then it was only in the end of the fifties when they started getting better income information about farmers, and you were a part of that mission. Did it get better in the 1970s through up to the present?

04-00:08:07
Tolley: It probably did, but I did not work on the details. In the seventies, I was still working actively in that area. But it probably got better, but I don't really have a strong opinion about it.

Burnett: So in addition to that work on and theoretical contributions to econometrics that come out of the practical work that you're doing, returning to Chicago in the late sixties, you arrived in '66, after your time in government, after your time as a civil servant. You return to that role again, but for the time being, you're back at Chicago. There was a rank adjustment there, because you were associate at NC State, and then full after three or four years, is that right?

04-00:09:16
Tolley: Yes, something like that.

Burnett: Yeah. So by the end of the sixties, I'm assuming that you return to Chicago at full; is that [right]?

04-00:09:23
Tolley: Yes, I'm sure.

Burnett: Okay. So one of the things we were talking about at the end of last session was this interest in urban economics. Notwithstanding Ted Schultz's interest in your continuing the banner of agricultural economics, urban economics pulls you for a number of reasons, including your work on rural-to-urban migration. But I want to get a sense of what urban economics is, when it becomes a discipline or a subdiscipline, a subfield of economics, and what else was happening in terms of social science research of urban problems, of urban growth and that kind of thing. Chicago's a big center for that research historically, going back to the nineteenth century. Social science at Chicago in the late nineteenth century and early twentieth century is very much devoted to the problems of the city, right? Urbanization is a set of social problems. So what happens to pull you towards working to define a subfield of urban economics?

04-00:10:59
Tolley: Right. So I later became very aware of the sociology department here at the university. They originated the study of neighborhoods and all of that. Very important.

Burnett: Right, Robert E. Park and those folks, yeah.

04-00:11:17
Tolley: Right. So let's see. We were, interestingly enough, talking about Resources For the Future. I don't know all that much about the details, so I can't really say too much about it. There were economists and geographers, and there was kind of a struggle. The economists, I think, finally won out. Their first grant was to Ted Schultz and what I was working on, but they were doing a lot of other things. They had some very outstanding people there—Marion Clawson

for example. And there's Harvey Perloff. Have you run across Harvey's name? I'm not sure he was a down-the-line economist. Anyhow, World War II was over. The population was suddenly going to the suburbs. The farm population was going continually down. So the non-farm population—I think that was even in the twenties—came to exceed the farm population. In any case, after World War II then, I think it was Harvey Perloff, who said, "There are these urban problems emerging and we don't have any economists work on them." So there was a person there. I'm going to block on his name. There was no model of a city.

Burnett: An economic model of the city?

04-00:13:21
Tolley: That's, yes, right. No economic model of the city. So this fellow—we can get his name; he's important in the history of urban economics—he dreamed up, as economists will do—they do simple models. So he said, "Let's assume that there's a factory people are going to work in. They have to choose a place to live, and they're willing to pay more if they have to travel less. So it's a travel-savings model of a city." What I'm saying, it's the first model. In a way, it is. On the other hand, in retrospect, people realized that it was the same as Von Thünen's model of about 1830.

Burnett: Right, right. Is that William Alonso maybe?

04-00:14:17
Tolley: Yes.

Burnett: It is? Okay.

04-00:14:18
Tolley: Yes.

Burnett: So that's *Location and Land Use*.

04-00:14:21
Tolley: Probably.

Burnett: Yeah, 1960, that came out.

04-00:14:22
Tolley: Yes, right.

Burnett: Okay. He's a Penn [University of Pennsylvania] graduate, and he graduated in regional science and Harvard city planning. Then he ends up at Harvard and runs their Center for Urban Studies in the early sixties.

04-00:14:39
Tolley: Really? But he did this work at RFF.

Burnett: He did?

04-00:14:45
Tolley: Oh, yeah, I'm quite sure.

Burnett: Okay, so the same kind of institutional or foundational origin as the work that you were doing.

04-00:14:54
Tolley: Yes, right.

Burnett: Interesting. That is really interesting. So you're part of a kind of cohort that is interested in these questions and probing these questions, way back in the early fifties.

04-00:15:10
Tolley: Well, in Raleigh, I was not really following that work very much; but I must've been following it to some extent. I don't know why. I think I got interested in it because the farmers were going to the cities. So there was this model. I said, "That's all very well, but people care more about how long it takes to get to work." So I said. "One has to introduce amenities into this model." That's basically what I did. But what we did, the ag experiment station being very generous, financed a household survey in Raleigh, North Carolina. We found out how much it cost people to go to work. We asked where they worked and found out how much it cost, then we subtracted that amount from the land value [of where they lived]. In the original Alonso model, that should've explained everything. The only thing you had was the economists' way. They restricted alternatives far too greatly. Anyhow, we found out that the neighborhood effects of amenities, in Raleigh, were about half of the costs. So the data was there somewhere in the sixties, but we published this article in *The Review of Economic Statistics* called "The Residence Site Choice." That was really the beginning of my work in urban economics. They didn't really call it that. First there was regional economics. There was a lot of interest in that. But regional economics was not even recognized as a serious endeavor. So the reason is that there were regional economists and then there were regular economists, and they didn't even talk with each other. In the course of things, that became clear.

Burnett: Well, so the "The Residence Site Choice" comes out in *The Review of Economic Statistics* in 1968. But it was based on work that you were doing in Raleigh. [With R.N.S. Harris and C. Harrell]

04-00:18:26
Tolley: Yes.

Burnett: So it gets published a bit later. And regional economics, I'm assuming, has a closer association with geography, right? Urban geography becomes the thing. You mentioned this kind of struggle between economists, at least for the favor

of Resources for the Future, back in the fifties, for disciplinary authority when it comes to these questions. The economists had a more quantitative or rigorous approach to the problems, and the geographers were not in the running. So there was a demand for a conception of the processes of urbanization and the costs of this or that type of factor flow. The other social sciences had been—so sociology and the social work—there's this focus on existing urban problems. So it's much more of an institutional and sociological and historical approach to understanding urban problems. So that's something that is not what you were doing at all. And your work is to answer another set of questions about the differences between types of urbanization or rates of urbanization, so it's much more amenable to economic problem solving. Is that a fair way of suggesting it?

04-00:20:17
Tolley: Yeah, I think so.

Burnett: So there is some work being done on this; there's William Alonso. Richard Muth, also known as Dick Muth, I think, along with your folks—

04-00:20:33
Tolley: Yeah.

Burnett: —he graduates from Chicago. I think he works with Arnold Harberger. Graduates in 1958, and in '60, he publishes that *Demand for Durable Goods*, which is—

04-00:20:47
Tolley: Very important.

Burnett: —with Al Harberger. So he's also associated with urban economics, to some degree. When you got back to Chicago, were there conversations with others on the faculty about this set of questions that you were embarking on? Or is this something that you were working on and had been working on, based on your lineage from Resources for the Future?

04-00:21:24
Tolley: Incidentally, Dick was and is—and I haven't heard from Dick in a long time; anyhow, that book is very important and we were very good friends and had a lot of communication. I think when I first got to Chicago, did I inherit a couple of his students? John Weicher, who's now at the Hudson Institute. He had a career in Washington. Anyway, as far as the economics faculty was concerned, I was largely it. Dick had gone to Emory University. I guess that's where he ended up. But as far as the economics at Chicago, I was kind of working by myself.

Burnett: Well, did you fold this into graduate seminars? Did you make this into a kind of workshop? Or is that later, when you're getting graduate students involved and interested in this?

04-00:22:42

Tolley: Well, the urban economics workshop started later, because it was not recognized. In order to even take a course in urban economics, I took it before the economics faculty and got them to vote it as a recognized field. I don't know when; it must've been the middle to late seventies that that happened.

Burnett: Right.

04-00:23:09

Tolley: But early on, I think the work for the Corps of the Engineers was at Chicago in the late sixties, because the people—Steve Hastings and the others—that I was working with were graduate students at Chicago. So I was working on that. In doing that, I really found out more about what traditional regional economics is and was. It's really something called input-output analysis. I don't know how deeply to get into this kind of—

Burnett: If you want to talk about it, that would be great. I think what helps us is to understand the shape of a discipline in comparison to something it's not. Right? So what is regional economics, and how does that work? And input and output analysis and what's limiting about that, with respect to what you're interested in doing? What does your set of techniques do that it doesn't offer?

04-00:24:21

Tolley: Right. Okay. There was Wassily Leontief. He invented input-output analysis. You just create a matrix. You put the inputs in rows and the outputs on the column, and then you enumerate what everybody does. Then you do various things with it. He didn't do anything regionally, I don't think, but people interested in regional economics took it up in a big way. The problem is this. You build a shoe factory somewhere, so-called basic employment. Then how big does the town get because of that? So you use this input-output [matrix]. The shoe factory buys leather and they hire labor, and the laborers buy food and all that kind of thing. So that's what input-output does very well. It became big in the government and people started expanding these matrixes more and more and more. That's all very well, but it's not a complete model of an economy, by any stretch. So that's what I and others did, was to bring economics into it. You have to bring in—well, one, the demand system's very naïve. You need to bring in elasticity, price effects and so forth. The regional economics thought that was all a bunch of malarkey; they didn't care about that. Then the biggest lack is that it doesn't bring in the factors side. Where is the labor coming from and so forth? That's an area that I worked in very strongly. So regional economics, I certainly didn't blame environmental economics for not having that, because it wasn't really serious economics, in the tradition of economics.

Burnett: Right.

04-00:26:51

Tolley: Adam Smith and Alfred Marshall and all of that, which was the tradition we were teaching out of thinking out of. So then that brings us to "The Welfare Economics of City Bigness." The question that I was dealing with was or was not that important; but the question is, are big cities too big because they have these pollution externalities? That's what the focus of that article, "The Welfare Economics of City Bigness" was. But in the process of that, I introduced labor supply functions. If labor doesn't work in this city, it's going to work somewhere else, and you have to look at the factor supplies. So you apply the tools, the concepts of classical economics. You have demands for goods, with normal demand functions; and you have supplies of factors. They're mainly labor, but there's a lot of capital, and then there's a lot of international intercity trade. So I know when I was finally teaching, that you put up a system of cities and say how they're interrelated, with this kind of framework, these tools, building blocks. So that's what was done in "The Welfare Economics of City Bigness." It's the first time I know of its having been used. I should mention the name of Vern [Vernon] Henderson. See, when I went to Chicago, John Weicher was in the middle of finishing his thesis. There were a couple of others; I don't remember their names. But then there were some students. Vern was a beginning graduate student and he worked with me. Vern is one of the outstanding regional and urban economists in the country. He ended up at Brown, which is where he is now, I feel sure. He used this. He at least credits me with a lot of the building blocks. But now it's being used by Paul Krugman. In about 2000, he published the so-called new regional economics. He was introducing these tools, and in a way that I don't agree with. If I get around to it, I'll write an article about that.

Burnett: Yeah. Or you can talk about it later. When we get to that time period, we can talk about it, if you want. So just to get a basic understanding, the input-output models, I think Arnold Harberger talks about input-output models in economic development, that these were these great—and amenable to computerization, so you can set up these great [tables]—with a whole bunch of variables on the input side, a whole bunch of variables on the output side, and then just crunch it and you've got your model. It drove him crazy. So if I understand it, the input-output model, in part, is problematic because it's less dynamic. Once you change something in this area, as it unfolds in time, there are going to be these other external options, outside of this simple matrix, that will change. And that will, in turn, have feedback effects. Is that what's better about your approach to understanding these things?

04-00:31:41

Tolley: It's certainly one of the principal things. I don't know. Al and I probably agree on this completely, I don't know. But in any case, if you do input-output analysis, your goal becomes to make this more and more fine-grained. Then you spend all your time finding out just what did this industry produce and export and buy and all of that, and you stop thinking about all the things you

should care about, this kind of thing that you've mentioned. It's the enemy of thought.

Burnett: It sounds like central planning. It sounds a bit like the kind of models for how to create a simulacrum of the economy. The Chicago folks are saying that this is a dynamic system, and you have to think creatively about how changes in one domain are going to have impacts on other systems, and that will in turn, come back, feed back and change that original variable. So this was sort of the beginning of attention to some of the questions around urbanization. There's a policy side always in the background, right? Because I think one of the questions with "City Bigness" was: The size of the city has all of these negative problems—the pollution and the congestion and all these undesirable qualities? So in a sense, you're applying some of those early questions of regional economics to this question of, in a sense, the costs of various kinds of externalities. So can you talk a bit about that, in terms of the policy climate of the 1960s? Help us understand what people were talking about, what the federal government was interested in, what the political climate was, with respect to urban pollution and some of the conflicts around and efforts to resolve what people understood as the problems of big cities.

04-00:34:36
Tolley: Well, certainly, the pollution and congestion were there. As I think we were talking last time, when I got back to Chicago in the late sixties, the urban problem—I forget when Watts was—

Burnett: '65, I think.

04-00:34:52
Tolley: Yes. The urban problem was at the top of the national agenda. Around here, we had the gangs. I know that there was the Center for Continuing Education. It's across the Midway there. I forget what they're using it for now. There was a series of presidents of the university, and they thought the university is getting too much involved in community affairs. So they shut down the Center for Continuing Education and turned it into offices or something like that, which a lot of us thought was terrible. Actually, now it's all changed. The university is quite heavily involved in things. But back then—I was not at that conference, but—they were having conferences. I think [the launch for] this trade book was held over there. Now, anyhow, they were having a conference there and there were the two gangs. I forget their names, but they confronted each other on the Midway.

Burnett: Really?

04-00:36:16
Tolley: Yes. So the urban problems became very close to home.

Burnett: Right. So if you talked to a historian and you mentioned Chicago and you mentioned urban social science in the 1960s, I think what would jump out at

them would be the Chicago Housing Authority and the University of Chicago and efforts to manage the conflicts that were happening after World War II. Because the African American population in the city triples, as a result of war work and the migration out of the South; and there is a historic African American ghetto that is filled to bursting, and African Americans are moving out of that, into historically white working-class ethnic enclaves, and there are these riots in the fifties that result. So the "solution," in quotation marks, was to do slum clearance and create these large housing projects that are just a few miles from here, like Robert Taylor homes.

04-00:37:29
Tolley: Yeah, Robert Taylor homes.

Burnett: Yeah, exactly, along State Street. We know the history of that, that there's the anomie, and the concentration of poverty and the lack of opportunity just breeds crime and it breeds resentment and hostility and [further] segregation, right? So that's the environment that you return to. You saw initially—. I think you said that crime problems and racial tensions were probably worse when you were in Raleigh, in Chicago.

04-00:38:16
Tolley: Right. So did we go through this? The so-called "black wave"—I shouldn't call it [that]—but it came down the South Side. It got to Hyde Park probably in the late fifties. I think it was probably just after I left. But the University board of trustees took a vote: Should we move to Aspen, Colorado? They decided to stick it out here. Then there was Julian Levi, the brother of the other Levi [Edward H.], who became attorney general and then president of the university. Anyhow, Julian Levi went to Washington, and he got HUD [Department of Housing and Urban Development], which were just introducing urban renewal, right?

Burnett: Right.

04-00:39:16
Tolley: So Hyde Park was the first urban renewal project. There was a whole history of that. It was very controversial because it involved tearing down a lot of housing, and a lot of it was black housing. I was working on things in the seventies and eighties, and we were doing household surveys and we encountered many black people who felt very strongly, negatively, about the university because of that history. Then of course, we had all the student unrest, had students coming into a class and camping out.

Burnett: So there was a Chicago version of the unrest that was happening on other campuses.

04-00:40:13
Tolley: Oh, yeah.

Burnett: Probably not as bad as Berkeley's, but—.

04-00:40:17
Tolley: [laughter]

Burnett: Nothing like happened at Berkeley, no.

04-00:40:24
Tolley: There was one incident; I don't know if they ever solved it. Somebody came into one of the offices and hit one of the faculty members on the head rather severely.

Burnett: In which department?

04-00:40:41
Tolley: It was one of the social sciences. It was probably sociology. It was not economics, of course.

Burnett: So this is the context. You're back in '66. '67, '68, there's the riots. 1968 is terrible. It's the Democratic National Convention.

04-00:41:01
Tolley: Right, right.

Burnett: And Detroit and there's all of that. Chicago has its own riots in the extreme. 1968, you joined the Interuniversity Committee on Urban Economics. Can you talk about which universities were these and what was the—? Who was involved? Can you tell me a little bit about this?

04-00:41:25
Tolley: Well, there were some very good people involved. I'm surprised that I joined that early; it meant that they found me. But people other places were beginning to work on urban problems. So who was there? Charlie Levin, who was a well-known regional economist. Then Ed Mills [Edwin Smith Mills]. Have you come across that name at all? Ed was in one of the Eastern universities [Johns Hopkins until 1970 and Princeton thereafter]. But he's a very outstanding economist. He, like me, if you will, was trying to bring, I'll call it "regular economics" into the analysis. They were people from leading universities.

Burnett: And this continues. Maybe the designation "1968" is just maybe a first meeting or something like that, because this goes on for twelve years. There's an Interuniversity Committee on Urban Economics; it's from 1968 to '80. It's the beginnings of a conversation about a field. So this has happened a couple of times in your career, and you have this—. I'm not quite sure how to ask this question, but it's a question about discipline formation. You mentioned going before the economics department committee and saying, "This is a new field. Do you agree?" Can you talk a little bit about the process of discipline formation or field formation? Is it something that has to come from

institutional supports? That it's the National Science Foundation says, "We need to go in this direction," or an interuniversity community? What are the drivers that form a subfield?

04-00:43:36
Tolley: Well, that's a good question. I'm not sure I'm an expert on this, although I was in the middle of some of this. I think it might vary. As I say, for some reason, I'm mentioning Harvey Perloff. But Resources for the Future was very instrumental in the beginnings of urban economics. Then this Interuniversity Committee was really more, well, it was also regional, but it was urban. How did it begin? What happened, maybe there was cross-fertilization in the Committee on Urban Economics. Although I was bringing in these factor markets and so forth, and most of the people in that didn't have any idea what I was even talking about. Ed Mills did, but most of them didn't. In any case, I don't know the year that I started teaching urban economics, but there was a great fervor. My classes would be eighty, 100 people. Everybody was so concerned. That lasted probably through the seventies, then it tapered off. It became just a normal field. There were a lot of people majoring in it, but that period of fervor, I think that the public demand was a part of it.

Burnett: So the student demand is a driver.

04-00:45:28
Tolley: Oh, yeah, definitely.

Burnett: Because it's not until '74 that you have the inaugural issue. The other thing I would say for what makes a field a field is a journal, right? You have to have a journal of record—

04-00:45:43
Tolley: Yes.

Burnett: —to say that this is where you go to find out about urban economics. So that's the apotheosis of urban economics, I suppose. But leading up to that, there's years of floating a course and finding that the doors are being busted down by students coming to work in this area. I guess this understanding, it's strong emotions, I suppose, at some level, at the end of the 1960s. When I talk to folks who were around in that period and into the early seventies, there was a strong sense of disorder and that things were unraveling. It is the beginning of, the strong rise of, the new conservativism, social conservatism. So things have gone too far [in this narrative]; the cities are out of control, and we need to get a handle on this. So young people are thinking about figuring out the world they're in. You talked about graduate students being kind of idealistic and wanting to solve, at NC State, trying to solve a problem, completely solve the farm problem. Was it similar with respect to the urban crisis? At Chicago, students were coming into their classes saying, "I want to solve this thing. I want to understand it and get my head around it"?

04-00:47:24
Tolley: Well, sure.

Burnett: So it's a heady time, early to mid-seventies is a big spike in your advisor role for graduate students. How many graduate students did you have at that time? Well, why don't I let you tell the story of how you handled your work load with respect to graduate student advising in the early seventies? How did you do it?

04-00:48:21
Tolley: Well, I just did it. I advised them.

Burnett: Did you meet with each one of them on a regular basis? How did you organize it?

04-00:48:32
Tolley: Well, yes. Certainly, one thing I remember, unfortunately, was that I would have appointments, and the line outside my door would be unconscionably long. But anyway, I met with them regularly.

Burnett: So this is a story that is circulated among your former students, that there would be an advising day, and you'd go and you'd line up, and there would be a line down the hallway, of people who were kind of going to see you. I'm sure you had slots for them, but—

04-00:49:11
Tolley: Yes.

Burnett: —like a physician in demand, you'd be going overtime, I think.

04-00:49:19
Tolley: Yes. I used to say, "I feel like a dentist."

Burnett: We talked about the 1974 article about city bigness. It's about these flows among these abstract cities of different sizes, and it's something we'll talk about in more detail. But you're not unconscious of the racial divides in American cities, and in Chicago in particular, the policy remedies that have been proposed to deal with inequality, with racial inequality, with racial injustice. You write about that explicitly in one article in 1971. But also in 1971, you are consulting for the Chicago Housing Authority. Are those connected? Or was that article on race and opportunity, was that something that was done well prior to that and it just happened to come out in 1971?

04-00:50:34
Tolley: Probably the latter. I wish I could remember what I did for CHA. I don't know. Have you run across the name of Gilbert White?

Burnett: No.

04-00:50:46
Tolley: He's a famous geographer. Gilbert took an early interest in and involved me in the National Academy of Sciences. When I came to Chicago, I went to meetings with him. That may have included CHA. I honestly don't recall what I did for the CHA.

Burnett: Okay. So it's kind of interesting. So the article is "The Effects of Government Policies on Employment Opportunities for Blacks." It comes out in the *American Journal for Agricultural Economics*, which was interesting. It sets the context in the 1970 recession, and you were already talking, this becomes a very famous turning point in American history. It's the recession, with high unemployment and inflation, which is not supposed to happen, under the Keynesian model. So you're looking at a more fine-grained fashion, at the problems of African American youth, especially, in low-wage, high-turnover jobs. Youth unemployment is upwards of 30% in the African American community. So you run through a wide range of policy remedies for racial inequality and segregation in society, and there are these policies that have to do with minimum wages, for example. You say that's a bad option; [it] increases unemployment, especially of low-skilled workers. You go through and say that some of these are more economic than others. Some of these make more economic sense than others. I'm not really asking a question about this; I wanted to just put this on the record as a comment, that you are thinking about these policies with respect to race. It's something you encounter in rural areas. One of the things that you talk about, you refer to them as "stick programs." I guess that means it's like carrot and stick?

04-00:53:38
Tolley: Must be, yes.

Burnett: Okay. So when there are programs that are redistributive, someone incurs a cost, but the benefit is socialized. So there's a geographic aspect to this because you say when you look at this in a spatial sense, people who are taxed for redistributive purposes in a particular area to deal with the inequality that is shared within that geographic space leave so that they don't have to pay that tax. But that leads to another kind of layer of spatial inequality. In effect, what you're describing are the economic aspects of white flight, right?

04-00:54:24
Tolley: Mm-hm.

Burnett: It sounds like it's the redistributive policies that are reinforcing segregation. Is that right, basically?

04-00:54:37
Tolley: Well, it's local redistribution policies that are doing that, yes.

Burnett: Right. So higher-income people are making choices to avoid redistributive costs. Then what's interesting is you suggest that that incurs other uneconomic

costs. So we're getting this wide suburbanization, as people are getting away from the "bad things" that they perceive in the city. In other contexts, you talk about pollution or that kind of thing. But this, a perception of crime, or fear of difference, or the fear that you were going to be taxed to pay for someone else's situation, that drives people away, and then you've got the added costs of that. I don't think this is necessarily one of your most important articles, but what it shows to me is that you're thinking about urban economics along these social lines. You're incorporating what is understood from sociology and from other disciplines, and trying to incorporate that into a model of spatial analysis. I think one definition of urban economics is that it's the allocation of resources across space, as well as the distribution [to individuals].

04-00:56:01
Tolley: Right.

Burnett: So is that something you kept to the fore? Or how did you incorporate these social and thorny historical problems into your economic models that have to do with the various kinds of costs and benefits? How does that factor in? Did it come in with your teaching, when you were initially teaching the courses in urban economics?

04-00:56:30
Tolley: I think it just came in trying to understand what was going on and being aware of these things that you're talking about.

Burnett: Right. You cite Gary Becker in this article. You talk about—

04-00:56:45
Tolley: What is the date of the article?

Burnett: It comes out in '71.

04-00:56:48
Tolley: I see, '71.

Burnett: You talk about income redistribution as a free-rider problem, and you cite Gary Becker's "A Theory of Social Interactions," which is an unpublished manuscript that doesn't come out until '74. So I'm going to guess, then, that you were certainly reading Gary Becker. He arrives in '68. You've said you voted to hire him, so you wanted him there. You knew about him beforehand. Can you talk about his influence at that stage? I don't know if you recall, and I don't mean to put you on the spot. But what about his way of thinking about things was helping you work through your questions when you were doing your research?

04-00:57:47
Tolley: I don't recall, at that time. Actually, in the fifties, Gary was a graduate student and I knew him at that time. Then he went to Columbia; then he came back

not too long after I did. I'm very interested that I referred to Gary at that point. I wouldn't have realized that I did.

Burnett: That's early, isn't it?

04-00:58:14
Tolley: Yes.

Burnett: Yeah. And it's something that doesn't get published for another five years, so I guess he was circulating that maybe in a workshop, as a paper.

04-00:58:25
Tolley: I just don't recall.

Burnett: So is that something that was happening on a regular basis? Because I don't think we figured on incorporating Becker into this set of questions that you have, but there he is. Is it through the workshop system? How does knowledge, how does preliminary work, unpublished work, how does that circulate in the department, as you remember it?

04-00:59:03
Tolley: Not overtly. It would just be because you knew somebody who— But I don't recall Gary showing me his manuscripts. I know T. W., of course, was a great fan of his, so it might've been that way.

Burnett: Maybe. I think there's a story about the elevators in the building, in the social science building, that people would— I don't know, the elevators took so long to come or something that you would stand around the elevators and people would talk while you're waiting for the elevator. Is that an apocryphal story?

04-00:59:45
Tolley: Well, I might've been involved in it a little bit, but it was not a central thing.

Burnett: So outside of the workshop system, was there a University of Chicago water cooler? Was it the Quadrangle Club? Again, it's this question of how ideas circulate. Socializing is part of that. Yeah, I'll just leave it at that for the—.

04-01:00:21
Tolley: Well, I'm calling it the Wednesday luncheons, but there was a weekly lunch. That was really quite important, in terms of circulating ideas.

Burnett: That was wide open? It wasn't a specific workshop or a specific theme?

04-01:00:40
Tolley: No, it was wide. Anybody would come.

Burnett: Those kinds of things are very important. You're still a bachelor in the late sixties, is that right?

04-01:00:55
Tolley: I married a year or two after I got back to Chicago.

Burnett: Okay. So it was in '69 that you married Alice?

04-01:01:05
Tolley: That's close. It was '68.

Burnett: Yeah. So can you talk a little bit about Alice? We should keep track of family things.

04-01:01:09
Tolley: Yes. Well, actually, I was getting acquainted with Alice before my return to Chicago.

Burnett: So do you remember when you first met?

04-01:02:16
Tolley: I met her in person when I came to give a seminar in connection with the job offer.

Burnett: Okay. So it was to do with your return to Chicago.

04-01:02:35
Tolley: Yes. We got married a few months after I came back then.

Burnett: Really?

04-01:02:41
Tolley: Yeah.

Burnett: Wow. Okay, so then earlier, so like '66, '67, something like that. Yeah.

Burnett: So there's a Tolley style of graduate advising in the bachelor years. I say that; I don't mean to say bachelor years, but you have free rein of your hours, so you burn the midnight oil often and you have graduate students coming by at all hours. This is your approach. You're a hard worker, let's put it that way.

04-01:03:35
Tolley: Yes.

Burnett: And that continues, but I imagine with married life, there are some constraints on midnight graduate advising and things like that.

04-01:03:45
Tolley: Yes, there are. I don't know how that worked out, but it worked out all right.

Burnett: Because you don't slow down with your graduate advising. In the early seventies, you're already married, but this midnight oil continues to be burned. So you're looking at developing a kind of welfare economics for

understanding the tradeoffs of these things that are kind of externalities, right? So pollution, noise, things like that. And you figure out a way to price this. I really appreciate this, living in the Bay Area, but this housing access commodity. You bundle housing and the time and effort and aggravation that it takes to get from where you live to where you work, so this spatial distribution of folks that has to do with suburbanization and sprawl and all of that has this cost. One of the things you're doing in "The Economics of City Bigness" is you're folding in this cost of distance and this cost of travel into the land values. Part of that is not new, right? People were thinking about that, and that actually goes back to William Alonso, *Location and Land Use*, to some degree.

04-01:05:24
Tolley: Right.

Burnett: But there're all these other things that you begin to fold in. So tell me how the economics of city bigness works, in terms of helping us to bring these external things into an economic rationale.

04-01:05:46
Tolley: Well, this goes back to Alonso. There, in that model, people only care about commuting costs. But there's no externality. If I drive to work, it doesn't cause any pollution, doesn't cause any congestion. This is the first time I recall that I brought in these externalities so explicitly. But the welfare economics story is a story of externalities. The cities are too big because there are these uninternalized externalities and people are not bearing the full costs of the pollution and congestion that they're causing. There's some mathematics connected with that, but that's the basic idea of what's going on.

Burnett: Is it developed simultaneously with the work on environmental economics, where you're figuring out how to price these externalities?

04-01:07:07
Tolley: Well, "The Welfare Economics of City Bigness" was a theoretical paper, entirely. So then the work on environmental pollutants and the urban economy, that's where you take a measurement of these things. So you go out and you get observations on the pollutants in the air, and you relate those to wage rates and to land values. You're measuring quantitatively what the externalities are.

Burnett: Right. Well, I want to get into that. In 1974, you're consulting for Housing and Urban Development. Is that connected to some of this research? So there is this urban unrest. There is public frustration with the environmental degradation of cities. The illustrative stories would be when the Cuyahoga River in Ohio catches fire in Cleveland. The river is so polluted that it would catch fire and there would be these surface burnoffs. So we have these sort of toxic industrial environments that people live in. And we're still living with this today, but there was a real strong public consciousness around this. It

results in policy changes and in the dawn of new state agencies, especially at the federal level, but also at the state level. So there's a context to the next phase of your, not next phase, but a simultaneous phase, at the end of the sixties. In 1970, the Clean Air Act is passed. As part of that, states have to submit implementation plans for how they're going to curb pollution, what their techniques are going to be. So the State of Illinois is interested in that because they're responsible now for this; they're on the hook. And the federal government is trying to understand this problem. So there's a policy impetus; we need to do something about pollution. We need to have abatement programs, we need to think about technology, we need to think about implementation, and we need to think about costs. Can you talk about how that begins to impact your career and how you fit into that new reality of environmental awareness and the dawn of environmental policy?

04-01:10:34

Tolley: Right. We were talking last time about the Farm Foundation and how in a very interesting way, clearly, those people had vision. They were interested in this. But as I say, I was at more and more of these meetings at the Farm Foundation and Larry Tombaugh, from the National Science Foundation was there. Pretty soon conversations and negotiations began. I don't know whose idea it was, but anyhow, we were funded jointly between Argonne and economics at Chicago, and the project was called "Environmental Pollutants and the Urban Economy." That was the idea of the NSF: Let's clean this up by getting these people together that can do this. That's what the whole project was about. I began a lot of interdisciplinary work with Argonne that I'm, in some sense, still doing.

Burnett: Can you talk about how that unfolded? It's written about in the report. This culminates in a report that comes out in '76, but this is a long project. You start this in '71, I think.

04-01:12:06

Tolley: Something like that.

Burnett: Yeah. And then it's even earlier that there are these initial conversations about what this would be.

04-01:12:12

Tolley: Right.

Burnett: Do you recall the initial meetings? What was it like? Who was leading it?

04-01:12:26

Tolley: Well, let's see. I was leading it here at Chicago. I was the point person. Then there's some people at the—. There were the Croke brothers. There was the original Croke. He was kind of a live wire. He was probably pushing a lot of this. He eventually left, and Kevin and Al Cohen came in. These people are all very able, but they're not that consequential. But the idea basically was that

there was air pollution modeling. For Chicago at that time, it was Gaussian modeling, which was the same as, well, if you drop a pebble in a pond, it'll ripple out. So that model explains the transmission of air pollution when you have a power plant that's emitting some toxic chemical. So we didn't know anything about that, but they knew all about that. But they didn't know what the economic costs and benefits of the whole thing were. So we spent years. There was air, water, solid waste. We published these volumes with Ballinger; they were the publisher. We published this series. I still feel they're path-breaking. We developed the framework for how you put all these together. Then we came up with various things. We found out, for instance, that Hyde Park was largely self-polluting. Hyde Park was terribly sooty, and the air pollution modeling brought that it was really just that people were still using coal locally to heat their homes. So they passed a version of the London Law that prohibited that, and Hyde Park became much cleaner.

Burnett: Oh, the London Law. So yeah, there's the big smog in the London Fog in 1954 that killed 6,000 people or something like that.

04-01:14:53
Tolley: Right.

Burnett: So now that's the other context I'm thinking of, air pollution becoming this action item for governments as in the wake of that, they realize that there are these costs. And other similar areas that were having tremendous pollution problems. So it was pretty bad in Chicago?

04-01:15:14
Tolley: Oh, yeah.

Burnett: This is, yeah, something that you recall. So prior to abatement programs, can we talk a little bit about some of the technologies that were involved? I know it's not your area of expertise, but it is extraordinary that there are these solutions that were available. There are scrubbers for smoke stacks, to get the SO_2, the sulfur dioxide, out of the emissions.

04-01:15:45
Tolley: The scrubbers are the kind of basic thing. I think at first, there were bag houses. Then there are scrubbers, then there are catalytic converters. Then they resort to fuels that are less polluting—low-sulfur coal and that kind of thing. So those are the kinds of technologies.

Burnett: So with Argonne, they're the engineers, is that right?

04-01:16:27
Tolley: Well, the engineers, those people—actually, they know quite a bit of the economics—but they're the engineers; that's where they came from.

Burnett: Okay. Argonne was the national laboratory that was charged with this. Was there a special expertise associated with Argonne that they had this? Or they just decided this is a lab full of able-minded scientists who could undertake this work?

04-01:17:02
Tolley: I don't know what the thinking was, but Argonne had started here at the University of Chicago as you probably know, so there was that proximity. That was probably the major thing that was going on. There were periods, and then there was this Argonne Committee and so forth. Argonne was primarily a physical laboratory, inventing things and so forth. A lot of those people are hard scientists, so-called, and they don't think it's appropriate to work on social problems. There is a significant group at Argonne that works on these problems. They still do. They do work in transportation and all kinds of things. But there was a period where they almost got rid of all that because the scientists against it were in the ascendancy. But they didn't; they still have that group. They're still doing a lot of good work out there.

Burnett: Right.

04-01:18:20
Tolley: I have worked with them over the years; I'm still working with them.

Burnett: So if they were going to get along with someone in the social sciences, it was going to have to be someone like you, who was, as you say, more, I think you said, hardnosed about—

04-01:18:39
Tolley: Well, I said hard science. I don't like that, because I think social scientists are hard scientists, too.

Burnett: Well, that's interesting, right? I would suggest that that's part of Chicago's identity, right? That this is a social science, but it is possible to know the social world. That's something that changes, I think, in a number of social sciences, where there's a kind of cultural turn that suggests that the social world is unknowable because the subject that knows is part of that group, so there's no objective separation, which continues to be the critique of Chicago to this day, that Chicago thinks it is separate from the world and is providing objective knowledge about the world; but in fact, it's in bed with that world and it's corrupted by that world. So can you talk a little bit about that identity, that Chicago identity about its understanding that you can have an objective, scientific understanding of human social problems?

04-01:20:00
Tolley: I don't know whether this is quite the same thing, but I did want to mention, at some point. There is a body—it still exists, I believe—any environmental regulation from the State of Illinois has to be approved by the committee or something, whose name I've forgotten. Someone from the law school became

head of that, Dave Currie. Anyhow, he became head of that. So the university was heavily involved in this real-world regulation from the very beginning. But then unbeknownst to me, there was Steve [R. Stephen] Berry. He's a chemist. He's an expert in atomic energy, actually. So he became, he and Dave Currie; his wife is very prominent in the state legislature. So they began, really, a seminar, a discussion group. Then Dave dropped out for some reason, and Steve came to me. He saw that there was this interaction between the physical sciences and the social sciences. So he said, "Let's run a seminar together." And we did. So that was the kind of beginning of that. Then we didn't see each other for fifteen years or so; now we're teaching a course called Energy and Energy Policy. It's a very fruitful course. The students write team papers, where there has to be a physical scientist and a social scientist together.

Burnett: Really?

04-01:22:33
Tolley: Yes.

Burnett: That's great.

04-01:22:35
Tolley: It's an extremely popular course.

Burnett: That's fascinating. Right. So there's no two-cultures divide between the social sciences and the physical sciences at Chicago.

04-01:22:49
Tolley: Right.

Burnett: Right.

04-01:22:51
Tolley: I don't know if this is the place. Then I also worked with Terry Clark. He's a sociologist. I don't know if you've run across his name at all. Anyhow, he was very interested in the economic aspects of urban phenomena. He became very enamored with the effect of amenities on land values. We did a lot of work together for a while. We also, in the past year, have started working together again. But anyhow, that's kind of where we are now.

Burnett: So you were collaborating with scientists outside of your immediate discipline.

04-01:23:42
Tolley: Right.

Burnett: And that that was fruitful. And of course, you had a common language, that there is a quantitative way of exploring these problems with attention to the complexity of the world, the dynamics. So you don't like to oversimplify a

model. You do like to see it as a dynamic set of relationships that unfold in time, and that that is something that serves you well. It allows you to communicate with other folks.

04-01:24:14
Tolley: No question, yeah.

Burnett: In terms of this collaboration, students of yours were also folded into some of this research. They were doing their own things, but I think you found useful things that they were doing, that ended up getting into this Argonne report. I'll just use that as a starting point. So for example, you talked about the importance of using revealed preferences in the market. Can you talk about revealed preferences a little bit, for one thing? But I think one of your examples was the premiums paid in risky occupations. So that's another way to sort of price the cost of being near something that's potentially damaging or actually damaging. You mentioned Glenn Blomquist and his study of seatbelt use as a way of understanding sort of quantifying the value of life. So there's an actuarial side to this, I suppose. Can you talk about how your students' research projects helped you to think about your work on this Argonne project, for example?

04-01:25:47
Tolley: Well, I think the formula in the federal grants, like the NSF work and so forth, the formula was this. Actually, the funding idea was the same as in the Land Grant colleges. You have a research project and you hire a graduate student. Actually, they're hired half-time. They use the research that they're doing in their thesis, so it's all one, really. I'm sure Glenn's work was just part of the—well, I know Glenn was around for several projects. Anyhow, that was the formula. Most of them were writing their theses in that way.

Burnett: Right. So we'll come back, I think, to this project, because I think it is so seminal in so many ways, and it leads to other things. In '74-75, you are called to service again. Can you talk a little bit about how that happens? I guess it's a kind of sabbatical year. You take a leave of absence from Chicago. Can you talk about that?

04-01:27:01
Tolley: Right. Well, let's see. This brings us back to Oz [Oswald] Brownlee. You remember him?

Burnett: I do, yeah. So he's connected to this?

04-01:27:11
Tolley: Well, I took his place when he went to Minnesota. Then he became Deputy Assistant Secretary for Tax Policy. The Office of Tax Analysis, I think is the name of it. It's a very outstanding group of economists. I know enough about the government to know there're some good places to work and some not-so-good places. Anyhow, that was a very fine place to work. Incidentally, the

assistant secretary is a lawyer, and he heads a staff of lawyers and economists, and I was heading the economist staff. So I learned a lot from that.

Burnett: No doubt.

04-01:28:02
Tolley: Anyhow, I think when you're in that job, the Deputy Assistant Secretary for Tax Policy is traditionally an academic economist on leave. So Oz had been in that job for a year. Then as I myself found out, one of your duties, or one of your things that comes to you, is you can name your successor. So Oz suggested me. This is the way these things work. Then the assistant secretary, the lawyer, he had worked with governor [Richard B.] Ogilvie in enacting a state income tax, and he had written a state income tax law. Ogilvie was defeated there after that because he introduced this tax. Anyhow, I think that because I was from Chicago and Fred Hickman was from Chicago, that had something to do with it. Then that brings us back also, when I started teaching, I taught macroeconomics, so I had the background to do this work. So that's how I came be there.

Burnett: Right. That is the same year, maybe down to the tail end of George P. Shultz's tenure as Secretary of the Treasury; is that right? That's '74, I think. Or was he already gone?

04-01:29:44
Tolley: No, he was gone quite a while.

Burnett: He's already gone by then.

04-01:29:48
Tolley: Who was the guy who was secretary? He was a formidable type of person. He was very frightening to work under. [William E. Simon, Secretary of the Treasury, 1974-77]

Burnett: But so he's not from Chicago then. We don't have that Chicago connection.

04-01:30:06
Tolley: No. I don't know whether this is relevant or not, but I had a nephew who was killed in the Tet Offensive. There was a very prominent political scientist here who was working with the Kennedys. Anyhow, I guess through him, well, I did some work. But anyhow, I allowed my name to be used in a *New York Times* ad against the war. So when I was being cleared for this job, they brought that up. Then they said, "Well, because President Nixon's position is so weak, we're going to ignore this."

Burnett: But they had a record—

04-01:31:12
Tolley: They did, yes.

Burnett: —of your name being used on a—. So they would keep track of every petition, major petition—.

04-01:31:22
Tolley: I don't know.

Burnett: They would take all the names down and then put a file for everyone.

04-01:31:26
Tolley: Maybe, I don't know.

Burnett: Holy smoke. Well, that kind of stuff has just accelerated, with a lot more sophisticated and powerful tools at their disposal. So there's this year in government. Again, that informs your understanding of the policy milieu, again in a different domain, so it strengthens you as a teacher because you're aware of this other set of questions. In around that time—I think we'll just put a parenthesis around this, because this is somewhat astride from the urban economics, and especially environmental issues—but there was some work on social policy that you worked on with a graduate student, I understand. It was around Social Security reform. That happens right around that time. Is that connected to the research or the work that you were doing in tax policy? Was it an understanding of the larger economy that—?

04-01:32:46
Tolley: No, it was not. It was, again, interdisciplinary. There was a well-known woman here; she was an expert on aging, Bernice Neugarten. So she had an interdisciplinary group and she was looking for an economist. So I worked with her. I met with doctors once a week, at breakfast at the Quad club, where we'd go, and other places. [Narrator addendum to replace answer: I found out that doctors do not eat breakfasts that are any healthier than those eaten by other people. We explored the adequacy of such programs as social security, Medicare, and Medicaid in terms of benefits and costs of meeting the needs of the elderly. As I recall it was quite illuminating and had some impact on my later continuing work on the economics of health. We put on a conference out of which was published the book, *Income Support Policies for the Aged*, Ballinger Publishers (Cambridge, Mass.:1977), co-edited by myself and Richard Burkhauser]. Burkhauser, whom I have kept in touch with on and off over the years, was working with me on his economics PhD dissertation. One day, completely on his own, Rich said to me, words to the effect that, "When you take account of government payments to program recipients, it's not clear that there are poor people left." I found the comment interesting but did not see the significance he attached to it and, as it was peripheral to the main thrust of my own research, did not take time to look into it further. Rich went on to become a noted figure in measurement of income of the poor, with a reputation for including government payments to welfare recipients—which were de-emphasized by other liberal-minded investigators. He has recently been rewarded by serving time as one of the members of the President's

Council of Economic Advisers, gaining more acceptance of his views and getting quoted in the *New York Times*.]

Burnett: Yes.

04-01:34:17
Tolley: I know we had a small dinner with a couple of my former students, at the meetings. I'd say it was a year ago. He was talking about should he be a member of the [Donald J.] Trump administration? He asked me because he knew that I'd been in government. The only advice I had for him is, "You can always resign." In any case, he was thinking of some position in HEW [Department of Health, Education, and Welfare]. About a year later, it comes in the newspaper he's appointed a member of the council. I didn't realize. He'd got very deep into the statistics, and he said there isn't any poverty problem anymore. There's so many welfare payments that you don't have to be in poverty.

Burnett: Was that recently or at the time?

04-01:35:24
Tolley: No, at the time.

Burnett: At the time, yeah.

04-01:35:27
Tolley: I thought, well, gee, that's interesting. I kept that in mind. But then at that dinner a year ago, he said he was for Trump; he would never be for Hillary [Clinton]. It turned out his father was a blue-collar worker in Baltimore. I don't know whether that had anything to do with it. Anyhow, he's now a member of the Council.

Burnett: So the research led to an edited volume with Richard Burkhauser in '76, '77, *Income Support Policies for the Aged*.

04-01:36:10
Tolley: Right.

Burnett: That was based on the '76 conference at U. Chicago. Is this the beginning of Social Security reform, in terms of the national scene? People have been talking about this for decades now and it's a perennial question. I read these arguments in this that are still being made today. "Social Security is an unfunded liability of $2.7 trillion." This is from this article in '77. There's an additional aspect of it. It is funded through payments on an as-you-go basis; but the Supplemental Security Income is not. That is an additional government outlay. So the argument of the paper is that there's two goals of Social Security. One is an old-age annuity; it's a pension system. But there's also a welfare payment. There's a redistributive component to it. I think the point of that article was that the added Supplemental Security Income component was

something that was more problematic. So at the time, he was saying that when you add up all of these benefits, that this just ends up being a redistributive tax, without this kind of welfare benefit. Or it's just an excessive welfare benefit.

04-01:38:01
Tolley: Maybe so.

Burnett: Okay. I think George Shultz writes a policy book, which comes out the following year, with Kenneth Dam [George P. Shultz and Kenneth Dam, *Economic Policy Beyond the Headlines*, NY: Norton, 1977]. It talks about the rise of entitlements, especially during the seventies. So is that something that really comes to the fore? I know it's a political football for various figures, and you're not so interested in that. But is that something that people were talking about as economists, that the growth in entitlement programs during the 1970s—? Was that quite a significant feature of discourse about government in the 1970s?

04-01:38:55
Tolley: Well, probably with Milton Friedman, it was. But the Chicago bent on this was markets and monetary policy, more than HEW or whatever we're talking about here.

Burnett: Right. It seemed fairly anomalous for a project that you were involved in. I think later on, you start talking about the health economics and you're getting into that. So that's another sort of policy domain that you start exploring that is distinctly social.

04-01:39:43
Tolley: Right.

Burnett: That's why I said parenthesis. It seems to be kind of a one-off in the seventies; is that fair to say?

04-01:39:55
Tolley: I think it is.

Burnett: [interview interruption] So returning to the environmental economics research that you were doing, there is some consulting in that period when you were working on the Argonne project. In 1974, some consulting for the US Commission on Water Quality, and I think the same year, the Committee on Automotive Pollution. Was that just part of the ongoing research that you were doing?

04-01:40:50
Tolley: I think so, yes.

Burnett: There was something for Iran, too, I think on urban pollution, in 1974.

04-01:41:02
Tolley: Right. That again involves Ciriacy-Wantrup in Berkeley. What year was that?

Burnett: It was 1974.

04-01:41:13
Tolley: I'm surprised it was so late. So yes, I went to Iran and was working on their problems. That was before the revolution. I think the Shah—.

Burnett: Yes, the Shah was in—.

04-01:41:24
Tolley: Right.

Burnett: Yes. So it would've been the urbanization of Tehran?

04-01:41:31
Tolley: It's more water.

Burnett: Oh, it's water?

04-01:41:33
Tolley: Yeah.

Burnett: Okay. So you had kept in touch with Ciriacy-Wantrup in that period.

04-01:41:42
Tolley: Well, I must say, I'm really surprised it's so late.

Burnett: Maybe it's a report that came out, but the work that you did or the travel that you did was part of an earlier project. I think the USAID stuff, there's something in '71. Then it's not until '77 that you again do work for USAID. Then it goes fairly regularly after that. I'm guessing that that is because the Argonne project was fairly consuming; that you were really delving into urban economics and the environmental economics side, and you really wanted to devote time to that.

04-01:42:44
Tolley: That's right. Also remember, I don't know what country it was, one of the Asian countries, but I had to take a week or two off from the Treasury in order to go to that country to do that evaluation work. They were surprised that I would try to do that, but I was very much consumed in learning about what was going on there. So before we leave the Treasury, I picked up an idea. Actually, I want to go back. When I was in the USDA, was that the Secretary of Agriculture? Anyhow, I think it was the secretary. He said, "People don't want to live in the cities; they want to live in the countryside." So that was something that I picked up, in a way; it was kind of motivating a lot of my work.

Burnett: Really?

04-01:43:59
Tolley: Yes.

Burnett: Interesting. So that's Orville Freeman, it would've been, I think, if it's '65, '66.

04-01:44:08
Tolley: Well, I'm not sure.

Burnett: Yeah. I think through the Kennedy and Johnson administrations, he was there.

04-01:44:19
Tolley: Well, this was probably an undersecretary.

Burnett: Oh, I see. Okay.

04-01:44:22
Tolley: Probably that's who it was.

Burnett: Okay. So it was one of the sparks that got you thinking about the value of living at a distance from the city.

04-01:44:37
Tolley: Right.

Burnett: Yes. I think what we'll do is, in another session, we'll go back through the list of students that you were working with at the time, to get a better understanding of the projects that you were working on with them and how that fed into your overall research program. It's like you had your own research program that was connected to the distinct interests of each graduate student; but it kind of fit into a larger set of questions that you had.

04-01:45:15
Tolley: Right. The way it worked, I had these research projects that I was funding, and here these kids were looking for support.

Burnett: Right.

04-01:45:26
Tolley: So they were willing to come on and work on this subject because there was some remuneration there, to a degree.

Burnett: Right. I guess from your time at the Economic Research Service into your early tenure at Chicago, there was the National Academy of Sciences Committee on Water. Does that ring any bells? You were working on stuff with them?

04-01:45:54
Tolley: Yes.

Burnett: Yes.

04-01:45:58

Tolley: Again, I won't say I was a captive economist, but there were a lot of physical scientists on that board. I think that might've been Gilbert White, too; I'm not quite sure. Before we leave, are we through with the Treasury yet or not?

Burnett: I think unless there's something that you learned from that experience that you then took away, that you then developed into economic research after, yes.

04-01:46:37

Tolley: So there is something. It's a point in asset-pricing theory. There is a history. I was talking about a fellow graduate student, Harry Markowitz. So he did take all three prelims at once and passed, which was amazing. Then I think he was working for the Cowles Commission, and he wrote an article that said it's very important to diversify. Which is almost a common-sense idea, but it had not been accepted in the portfolio theory, asset-pricing literature, the finance literature. So he wrote this article positing the simple idea is that you need to diversify. So the people in the finance fraternity took it up and it was the beginning of modern finance theory. The logical end of it is that you want to hold every security, because every time you add a security, it reduces the risk, it reduces the variance, the expected variance of the earnings. So to this day, the accepted theory is that the investor tries to hold the market, so-called, a sampling of all securities. The problem with that is that it ignores the cost. So if you're adding a security, that's certainly true; it's going to reduce the variance. It's just a probability theorem, a very simply probability theorem. Of course, we all know that if we have only one security, it's very risky; if we have two, you're spreading the risk.

Burnett: It's pretty common sense, yeah.

04-01:49:01

Tolley: So the logic of following what the finance fraternity has done, say if it's a good thing, do it all the way. The problem is, it ignores the cost. See, if I have only one security and I add another security, it reduces the variance maybe by a half. But if I add a third security, it reduces the variance by a third. I'm probably not using exactly the right numbers.

Burnett: But it begins to vanish, correct?

04-01:49:39

Tolley: Yes, that's right. So if you have to devote any cost or effort to choosing those securities, pretty soon it's going not to pay you to diversify further. Well, I've been working on that idea ever since; I'm still working on it. For whatever it's worth, it's very difficult to convince the people in the finance fraternity of how important this is. But anyhow, it's an idea that it came out of there. You take that idea and you have to go through to how to have a theory of the value of an asset. How is that working in the market, where there's aggregation of investors going on. So anyhow, that came out of that experience.

Burnett: At the Treasury. Harry Markowitz was the one who—?

04-01:50:40
Tolley: No, no. I'm just mentioning him.

Burnett: Oh, okay.

04-01:50:44
Tolley: He would probably agree with this. He moved on to other things.

Burnett: So this is a problem that you happened on while you were working at the Treasury.

04-01:50:54
Tolley: That's right. And I'm still working on it.

Burnett: You're still working on it. It's something that the finance folks don't consider important? Or they don't understand the importance of it?

04-01:51:09
Tolley: I don't know. I'm very disappointed in them because the idea is just so straightforward. But it's that kind of thing. I've only scratched the surface; there's a lot more to how it plays out.

Burnett: Right.

04-01:51:30
Tolley: Anyhow, so I'm still working on it.

Burnett: I want to just make sure that I've got the full picture of "The Welfare Economics of City Bigness." Would you say that that is—it appears in the first volume—it's a seminal paper in urban economics, of that modern form of urban economics?

04-01:51:57
Tolley: Yes, I would.

Burnett: So I just want to make sure I got the difference right. So the big assertion is that wages differ among cities due to the differences in the costs of producing non-traded goods. The wages are higher in one area because [of] commuting costs, plus these negative externalities, such as pollution and congestion and crime and so forth. So the question then turns to the most economic policy to deal with this. I like the adjectives that you use, because you signal what is a better or worse policy. So one way of doing it is to tax the hiring of non-location-fixed resources. So to make it more costly to live in the suburbs, for example, so you encourage concentration, or the other way around, whichever is more economic. So you make it more attractive to live in the city, which you said was a grandiose approach. A better approach would be to locate federally financed institutions in smaller cities. That's something that we've

seen come to pass. You have these large government facilities in these smaller towns. Sometimes it's a logrolling boondoggle. For example, the National Tax Center in Canada is in Shawinigan, Quebec, which is the hometown of a former premier.

04-01:54:07
Tolley: I see. I see.

Burnett: But it does provide for regional development, and also the land costs are lower and that kind of thing. So you find mints and things like that are located in these places. That makes sense. Then the frontal attack, you say, is to tax the externality-causing activities, right?

04-01:54:35
Tolley: Yes.

Burnett: So what are the implications of "The Welfare Economics of City Bigness?" If you're going to deal with this, what's the least disruptive way of managing these externalities, if you've got a particular social policy that you want to pursue?

04-01:54:57
Tolley: Well, I'm not sure anybody ever asked. I was supposed to attack the externalities directly, which is the position that I came more and more to be interested in, let's put it that way.

Burnett: Right. So the Argonne research is undertaken for three or four years. It's '72 to '75. Then the report is published in '76. There's kind of a story that I'm interested in a little bit, if you could tell me more about it. The State of Illinois is interested in this and they're involved as well, right? Because they're in charge of implementation of the Clean Air Act.

04-01:55:43
Tolley: Yes, right.

Burnett: So they have an interest in this. So the Illinois Institute for Environmental Research is something that you're involved in.

04-01:55:52
Tolley: That's the thing that Dave Currie headed.

Burnett: Oh, okay. That is it.

04-01:55:57
Tolley: Yes.

Burnett: In 1975, there's an Illinois Supreme Court decision that argues that regulations must be both feasible and economic, right? So it's really the establishment of this approach, because you and the people that you were working with

establish this way of doing a cost analysis to deal with these externalities. You can see this in the pattern of the publications that we'll talk about in subsequent sessions, that you're able to do this, in effect, a benefit-cost analysis of an environmental intervention.

04-01:56:50
Tolley: Yes.

Burnett: Saying, it costs $4 million to do nothing, and it costs $12 million to have this particular environmental intervention to reduce pollution. And you say, well, on the basis of that, it's not economic to undertake it. So right at the beginning of the establishment of federal and state bodies for environmental control, there is now provision for the evaluation of the costs of operations, and then states can decide whether or not it's possible to go forward. Broadly speaking, has that continue to this day? Is there always a kind of cost analysis of environmental policy, where they decide it's not worth doing this to abate this or that environmental pollutant?

04-01:58:05
Tolley: As far as I know, it's still going on. I know that the state law set up the institute. Then I used to appear before them for many, many regulations where we'd do benefits and costs. As far as I know, it's still going on.

Burnett: Does that then also apply to private companies as well, that are then charged with cleanup—say for example, in the mining industry—where the EPA comes and says, you need to do this or that cleanup. Can they then appeal? This is probably not necessarily within your area, but can they then use those techniques of cost analysis to say, this is prohibitive or, you'll shut us down if you want us to achieve this threshold of environmental cleanup?

04-01:59:00
Tolley: Well, this is purely state.

Burnett: Yeah.

04-01:59:05
Tolley: It's not federal.

Burnett: Oh, the Argonne stuff is the Illinois—. So Argonne is a national laboratory. The NSF was the national—.

04-01:59:17
Tolley: Yeah, so this is completely independent of the Argonne work.

Burnett: Oh, it is?

04-01:59:21
Tolley: Yeah. This was set up— I don't know if they even knew about us. Anyhow, when it was set up, then we had this expertise and started.

Burnett: So it's '71 to '76, the Illinois Institute Natural Resources, that was the state project. Then the Argonne project was '72 to '76, which was—.

04-01:59:45
Tolley: The state just set up this institute, which was a permanent thing. I would suppose what you need is just the year that it was instituted. It would be there along in the seventies.

Burnett: Okay. Great. Well, why don't we pause now and we'll continue talking next day.

04-02:00:09
Tolley: Okay, good.

Interview 5: February 2, 2018

Burnett: This is Paul Burnett interviewing George Tolley for the Economist Life Stories project. We're here in Hyde Park, Chicago. This is our fifth session, and it's February 2, 2018. We were talking about the development of your interest in the foundation of new fields of economic endeavor, urban economics and environmental economics. I wanted to continue to get a stronger sense of urban economics and the research programs, the research program that you were undertaking with a number of graduate students. I'm wondering if we could talk a bit more about what was new or different about urban economic analysis. So I think it's often instructive to talk about what's wrong with a situation. So when you were exploring how other social scientists had explored the problems of the city and the problems of urbanization, what were they missing? What was wrong with how they were looking at things? Not to disparage them, but just to say that this was something that was not quite right or not satisfactory to you, that you wanted to correct with your tools.

05-00:02:03

Tolley: Let's do the regional first, because there was a field of regional economics. I think we talked last time about input-output analysis. It was confined to that, and it didn't use price theory at all. You're talking about shortcomings; that was the biggest shortcoming. So as far as myself as a trained Chicago economist, or any economist, the goods of which is price theory, regional economics was not a field to be taken seriously. There were regional economists, and there were regular economists, and they didn't really talk to each other at all. So on the regional side, that was the situation. Some people said, well, what was wrong was that they needed a trade-theory approach. That is partly true. That's a valid criticism, if you will, because cities trade with each other and they have specializations and that kind of thing that happens in trade. However, cities have factor mobility. The Interstate Commerce Clause says you can't interfere with trade, so all these cities trade with each other. That trade part is very well, but if I grow up in Atlanta, I can choose to work in Chicago or San Francisco or anywhere. So there's mobility on the factor side, as well as for labor, the human side of it, and for the non-humans, the physical side of it. There were national, and international, for that matter, money markets and the funds flow all around. So a trade model gets you part of the way there, but not really the essential way there. So that's the problem with so-called regional economics. When there was this field of regional economics, the department of economics didn't have urban economics, and no good department of economics had that. I shouldn't really put it quite that way, because there were some very able so-called regional economists. That's the regional side of it.

You're asking about the shortcomings. Then on the urban side, there was no urban economics. This wasn't recognized as a problem. As we were talking, I believe it was Harvey Perloff, at the Resources for the Future, under his

auspices. William Alonso developed this model, and it was the first urban economics model, and people got very interested in that. It was very important work.

Burnett: That was the access and the transport-costs model.

05-00:05:55
Tolley: Yes, right. The city was driven by optimizing in the face of commuting costs, of course, a fundamental idea, but again, only partial. So I was reading the Alonso work. I was getting interested in urban problems while I was still in Raleigh. So I read that and I said, "People care more about how long it takes to get to work, when they're getting a place to live. So they care about amenities." So I don't know whether we went over this last time or not, but we did this household survey in Raleigh, and were able to tease out the fraction of land values that was due to travel savings. It's certainly an important thing. But then there was another part—and it turned out in Raleigh, just about an equal part—was due to amenities, other things that people cared about.

Burnett: Can I ask for a descriptive explanation, without so much recourse to formula, of how you're able to apportion that residual that, we're going to say, is due to someone who enjoys clean air? So you want to set up proxies for that and then weight it according to some kind of formula that you establish for this?

05-00:07:44
Tolley: Well, that's the kind of thing you want to do eventually. What we did in Raleigh was, we took a random survey of households and we asked at each household, how far they lived [from work], what their commuting cost was. So we converted that to a yearly basis. A person who lives closer to the center of the city would be hypothesized to pay more. The Alonso model says you pay the premium; the saving goes into the land value. So one thing you do is compute the amount. It's travel savings over cost of commuting from the edge. You figure out how much less people are paying in commuting costs, from living closer in from the edge. That is an amount, then, that the model says you should be willing to pay for the land where you're living. So we measured the land value. Of course, that's what we found out. Yes, it's certainly true that there is this premium, and there is some tendency, I guess we can get into that. So that's the theoretical, if you will, land value premium, if the only thing you care about is commuting costs.

Burnett: Right.

05-00:09:36
Tolley: So then we compared that with the actual land value, and we saw that those premiums accounted for only about half of the urban land values. And then we attributed the other half to the amenities. At that point, that's all we did in this.

Burnett: Then it's developed more fully what are amenities and how do we disaggregate the value. If there's obviously multiple amenities, if you expand

that notion, as you do—and we'll talk about that in a moment—the question then becomes, how do you weight those? Perhaps it doesn't get that far, or perhaps it can't get that far. But I guess you would look for these kind of natural experiments or these revealed preferences, where you would be able to say, okay, it's because people really value this park that's next door, or child rearing is easier in this area, and there's some evidence that you can point to that's very concrete. So that's the next phase, I suppose.

05-00:10:54

Tolley: Yes, it is, exactly. You start doing land-value studies. So you go out and collect a sample of land values. We did a lot of studies like that. We studied the value of views, among this, for instance. Then school quality, proximity to transit lines, those things.

Burnett: So are we going to attribute the "million-dollar view" to you? Is that where that phrase comes from? I guess you figured it out.

05-00:11:31

Tolley: Not from me. Believe me, we paid for these. You don't pay a million dollars, but you do pay a premium.

Burnett: Absolutely. So in thinking of what's the contrast between this economic orientation, this kind of trade-model orientation, as opposed to the other social policy problems, thinking back to early social science reform, where a city like Chicago had grown extremely rapidly, you had these problems of urbanization that were largely questions of adjustment, so that the objects of social policy were things like poverty or anomie or isolation, those kinds of things, and you could act on them discretely with various kinds of government reforms and so on. What I see in this literature is that in a dynamic economic framework, there are real limits to what you can do in terms of social policy, without affecting changes in the composition of populations. So for example, you can make policy that attracts people to a particular locality, as they're attracted because of these amenities that you talk about, or you can push people away, and that can be a desirable kind of manipulation. But I think what you're often arguing against are the kinds of policies that don't take into account the freedom of movement, this factor mobility that you're talking about. So a minimum-wage policy, for example, that would raise wages above their market optimum, that raises costs. Similar policies which encourage the concentration of populations that have challenges that are costly, that then result in taxation, that then place a burden on those who are paying the taxes, that then forces those people out. So you can get this appreciation for policy being governed by the mobility of populations that can move out from under government jurisdictions. Or maybe I'm focusing; it's something that I see. But if I'm contrasting this economic orientation, it seems to be just that emphasis on these factor mobilities that limit policy that others would say, well, we have, for example, poor people here, so we need this kind of welfare

intervention, not recognizing that that's going to have knock-on effects, in terms of the behavior of people.

05-00:14:59
Tolley: Well, you would use this analysis that I was involved in to do that, and we did it, to a certain extent. I should go back. It did not originate with me. It originated right here on 55th Street by Martin Bailey and then Dick Muth.

Burnett: Oh, yeah, the Bailey-Muth model?

05-00:15:25
Tolley: Yes.

Burnett: Right.

05-00:15:26
Tolley: That comes out that the blacks pay less for housing than whites, because whites don't want to live near blacks. So they will move out and depress values. Anyhow, Dick Muth was here, and so was Martin Bailey, and they developed this, incidentally, with a Hyde Park hypothesis. I think this work of Barton Smith was, in some sense, an extension of that.

Burnett: Yes, it was. That's right. It's drawing a distinction between discrimination and prejudice, which is an interesting—

05-00:16:11
Tolley: Right.

Burnett: —and extremely thorny, difficult thing to deal with. But I think he's trying to make a general argument about amenities, and it's an extreme— Well, let's go into that when we talk about that volume, I think. But that's one facet. I guess I'm focusing on the social policy side of it because I think what was difficult for me to wrestle with as I was becoming familiar with this literature is this twinning of urban economics and environmental economics. So urban economics that deals with pollution is also environmental economics. So what I'm doing is here, by focusing on social policy, I'm calling that strictly urban economics, because it has to do with preferences and these kinds of things that are not necessarily related to environmental quality—although you can debate where the line is there, I suppose. It reminds me a bit of Thomas Robert Malthus. There was a non-optimal positioning of the population, because of the Poor Laws. So the Poor Laws dispersed welfare payments to people by parish. The parishes were, of course, distributed widely across England, and the factory jobs were in these towns. So the Poor Laws were depressing labor mobility, and this was a problem. There's almost a kind of inverse Malthusian issue going on with some of the analysis here, where welfare payments are concentrating those who need more resources, and are pushing away those who pay taxes. So you're explaining what ends up being a kind of racial dynamic, a white flight away from the central urban core, because there is a

desire to pay lower taxes, a desire to have other kinds of amenities, as well. So it's reminiscent of some older visions of political economy, but it's attuned to the particular dynamics that have evolved in twentieth-century cities, especially in the United States.

I guess one question that comes out of that is that the early social-science reformers were trying to understand poverty or trying to understand the social ills of the city, in order to figure out remedies. This urban economics approach seems to look at the ways in which policies themselves and the weight of the city development itself has created these structures that are sub-optimal. Attention then must be paid to cities as part of a larger interurban or urban ecosystem, in which people and capital are moving between cities or among cities. That seems to be a way of understanding how structures evolve and how they need to be adjusted. So you can't just have a policy for something in isolation; it has to be considered in connection to all of these other dynamics. Is that a fair characterization of the unique steps of urban economics, in contrast to regional economics and in contrast to this social policy of the early twentieth century?

05-00:20:33

Tolley: Well, I think it is. I think the motivations of myself and others was just to bring good economic analysis. It really was to bring the framework of classical economics to bear on these urban phenomena, which had not been done before. You're bringing up a number of interesting things here. When we get into the factor mobility, we were talking about land values within the city and so forth and the effects within the city, which is the amenities story within the city. But then part of this conception of cities is as part of a larger economy. What is part of that? That is that labor is mobile. So we started doing a lot of regressions which are still done. Wages are lower in high-amenity places. If the air quality is good, people will go there; and they'll take a lower wage, in order to be compensated for that. So it gets very much into intercity wage differentials. We did a lot of work on that. There's another very important idea. Have you run across the Tiebout hypothesis?

Burnett: You mentioned it before, yeah, but you can talk—.

05-00:22:12

Tolley: Charlie [Charles] Tiebout. That came out when he was at Northwestern and he noticed that his colleagues, his Catholic colleagues lived one place and so forth, and his Jewish colleagues another place and all of that. So he said people choose the bundle of government public services that they want, and that's a part of this intercity or inter-suburbanist mobility. That Tiebout hypothesis was very—still is—extremely important. There's a lot of important work done in that area.

Burnett: I think I know the answer to this before I ask it. I think the answer to my question is, this is a universal phenomenon. These are universal mechanisms

that unfold uniquely in each case. So you have to be very careful. I think one of the policy recommendations is not to have a cookie-cutter policy recommendation. That's where you start, right?

05-00:23:30

Tolley: Right, yes.

Burnett: On the other hand, it does seem like this is a uniquely American conception of urban problems that are rooted in the history of the United States and in the way the United States government evolved. It's almost crying out for an institutional analysis, right? Because there are these local government policy decisions and there's this mobility that spills out. So people spill between urban municipal borders; environmental pollutions spill out, and there's an airshed of air pollution; and water is the same thing. So there are these islands of laws and institutions and regularities that are there and have evolved to manage a city of a given size, that are encompassed by state governments, that are then encompassed by a federal government. And it's at this moment in history where you have an increase in regulation at the municipal and the state and the federal level, and you're trying to tease out these optima and disequilibria that are arising from a combination of regulation and a combination of this factor mobility that is moving out from under all of these jurisdictions.

I have no evidence for this whatsoever, but I think when you look at the mid-century, post-World War II United States, and the United States of the 1960s into the seventies, you're beginning to look at hollowed out, highly polluted, sclerotic municipalities in the Great Lakes area; then highly dynamic, fast-growing cities in the Southwest, in the South. So you have these different portraits of dynamism and sclerosis, and new calls for management of areas that have become extremely polluted. We're dealing with the consequences of decades of urban development and industrial development and the flows of people to less regulated areas. So urban economics seems to be a kind of response to that moment in American history. Of course, you can just make a just-so argument and say it happened then because it was at that time. [they laugh] No one's going to necessarily gainsay that. But I do think about that. I do think about what's particular about the 1970s—the optimism of the sixties, that the United States' way of doing things is the best way, running up against limits, and new discourses around limits. So in '72, there's the Club of Rome Report saying we're running out of resources; and if we used all those resources, we'd pollute ourselves to death. And the recognition that federal authorities needed to regulate the despoliation of the environment, in order to have a decent environment in which to live and in which to grow. So I do wonder about the timing of this. The urban economics approach was to recognize that the regulatory efforts need to have an understanding of capitalism, at least in its American variant, and to understand that the regulatory systems and the dynamics of capitalism aren't really going to help you optimize your cities or your living spaces, without some kind of different

way of reconciling the dynamism of capitalism and the social policies that people want. Is that a fair characterization of urban economics, in a very convoluted and round-about way?

05-00:28:20
Tolley: Well, I think certainly, it's consistent with that. I've never heard it put quite that way, although times were changing. Incidentally, I'm reminded of this. The nineteenth century view of the location of industry was very much resource-dependent. We developed Chicago partly because of its concatenation with the iron ore and all those kinds of things.

Burnett: Yeah, and forests.

05-00:28:53
Tolley: And generally. Then somebody discovered, well, the movie industry started out in New York and Chicago and the West Coast. It pretty soon ended up on the West Coast because of the weather in Chicago and New York. When it rains, you have to stop production. So it doesn't rain in L.A., so, that kind of thing. People began to recognize that there was more to the location of industry than was recognized by the regional economists, frankly. That's a part of this broadening out or making regional economics a little bit more satisfactory, which I think is true.

05-00:29:49
Tolley: So times were changing.

Burnett: And this was an adaptation to it. I think there was a general—. I don't think you understood yourself this way, but I think George Shultz was writing about—because he was seeing it firsthand—the growth of entitlement programs and the trajectory and the projections. That was the [Richard V.] Burkhauser thesis, as well. I think that was another facet of the same orientation, that we've set up this regulatory regime that is unsustainable under its current plan, and so we need to think about that. Then I think of Milton Friedman's political orientation in the sixties and really trying to change the conversation at the national level about the beneficence of regulation. I think that he was arguing, and his mentee Ronald Reagan was arguing, that government is not a solution to everyone's problems. It's not going to fix everything; in fact, it was part of the problem. So if there was a public face to Chicago economics, that was it. Did you find that there were similar assumptions about environmental policy regulation, that people were, to some degree naïve about what environmental regulation could accomplish with the Clean Air Act and Clean Water Act in '72? That this was going to give us a new era finally, where were going to get a handle on pollution? Or was it less out of the public eye because it was complicated? Let me put it this way. Your audience is not the public. Your audience is other experts of different kinds. Would you say that's a fair thing to say?

05-00:32:07
Tolley: Well, it's government officials. And I guess newspaper editorials.

Burnett: So there's a second-order effect on the public sphere, but that's not your primary concern. You want to reach the people who are making decisions about policy.

05-00:32:24
Tolley: Yes.

Burnett: And you want them to make the most economically sound decisions possible.

05-00:32:31
Tolley: I think that was our aim, was to do that. I don't know whether we thought it was possible or not possible. That was what we were trying to do.

Burnett: You weren't discouraged, at any rate. You had no reason to be completely discouraged at the outset.

05-00:32:45
Tolley: That's true.

Burnett: Okay.

05-00:32:49
Tolley: Let me add one more thing.

Burnett: Oh, yes. Of course.

05-00:32:50
Tolley: I taught urban economics straight through for many years, until a couple of years ago, actually. But then I also taught environmental economics. There's a person, Sabina Shaikh; we taught together. But when we were teaching environmental economics, we taught market failure. We need environmental policy because of these externalities. The whole first part of the course is drilling into that quite, quite thoroughly. So that was a part of this. I don't know when we started that teaching. Anyhow, it's still going on; that's the way that one teaches environmental economics.

Burnett: So it's not by any means market fundamentalism.

05-00:33:54
Tolley: That's correct.

Burnett: It is a recognition that under certain circumstances, markets don't give you the optimal outcome, and so there needs to be some adjustment. But always, that adjustment is in the context of markets.

05-00:34:09
Tolley: Yes, yes.

Burnett: So that is the difference. This isn't in a vacuum. You can't just unilaterally say this is how this is going to work, without having some kind of market outcome on the margins or on the fringes of this. So let's then talk in some detail about *The Economics of Urban Amenities*. This is a volume that comes out in 1982, and it's with Douglas Diamond. You co-edit this. I wanted to ask. I think what's striking about this, there's a thanks at the outset, of the contributors to the thinking that went into this volume. It's D. Gale Johnson, Bob [Robert] Lucas, Al Harberger, Larry Sjaastad, and Margaret Reid. Of course, what leaps out at me immediately is that there are two agricultural economists who came with Ted Schultz from Iowa State University in the middle of the 1940s [Johnson and Reid]. I think about this ongoing, this agriculture group. Is that just because they were thought partners that you were comfortable with? That the agriculture group was a kind of incubator of this benefit-cost analysis that ends up being applicable outside of the agricultural field, to urban economics and environmental economics?

05-00:35:54
Tolley: Well, in this last things, yes. I think we talked about this before. Nobody'd heard of benefit-cost analysis until we got this grant from Resources for the Future. Then we discovered this *Green Book* from 1936, where somebody, some clerk, had built that into the law. So Al and I worked on that together. I take some credit for the fact that Al went in that direction. You were asking me at some point earlier, who were my intellectual colleagues. You kind of named them in that.

Burnett: Oh.

05-00:36:49
Tolley: I think a lot of them—I'd have to go back—were people, a lot of those chapters were based on theses, and they were probably members of the

Burnett: Committees, right?

05-00:37:05
Tolley: Yeah, right.

Burnett: That's right. There is a biography underway for Margaret Reid. It might be done now. But not so much is known about Margaret Reid. Can you tell me a little bit about her? She was a premier expert in home economics. She did war work around aggregate nutrition levels. Something like that.

05-00:37:36
Tolley: Probably.

Burnett: Yeah. Can you talk about her as a scholar and as a member of the Chicago department?

05-00:37:42
Tolley: Well, she didn't have a strong theoretical background. She was a very tough, hard thinker, and very vocal. The graduate students were deathly afraid of her. She was a little old lady with apple pie, but when she got to questioning you, you sure knew it.

Burnett: Well, there's talk about Chicago economics as a kind of masculine, it's like a macho culture. I don't think that applies across the board. Some people have described some workshops as a shark tank.

05-00:38:26
Tolley: Right.

Burnett: That it's highly competitive, in some ways combative, but almost in a sportsmanlike sense. So it was really combative, but it was meant to make the group stronger. It was this sort of nineteenth-century battle of 'nature, red in tooth and claw,' as a way of doing economics. Here is this woman who is a key member of this department, is profoundly respected. So in some ways, I guess she had to be tougher, to be more Venetian than the Venetians, to adapt to that environment. Or it's just that she was already like that and she fit right in?

05-00:39:16
Tolley: I don't know. I thought she fit right in.

Burnett: Right, right.

05-00:39:22
Tolley: She was definitely a member of the ag economics fraternity. I probably knew her before I got to Chicago. There were some women in BAE. They originally called themselves home economists, but they did a lot of important demand work. I guess Margaret Reid was part of that group. She was very good, a very tough thinker.

Burnett: Yes, well, home economics was a very gendered—

05-00:39:57
Tolley: It really was.

Burnett: That was a very gendered thing. That's what you went into. But the women who went in there used that to do very mathematically sophisticated work that had a national impact, especially when it comes to the war, right? So you're talking about rationing and figuring out requirements and such. So I just wanted to acknowledge her impact on your world and the world of other Chicago economists.

05-00:40:30
Tolley: Just to reemphasize something, earlier I was saying that I chose Chicago because it was not the Ivy League. And kind of what you're describing is one

facet of that. I myself thought it went far too far, far too much that way. In my workshops, we never carried it that far.

Burnett: That's what I hear. There's a different flavor; each workshop was different. There's a portrait of workshops as being this combative space or, "I'm right and you're wrong," and there can't be two right people in this context. Al Harberger would describe his workshop as largely characterized by silence. So someone would ask a question and they would sit there for twenty minutes, thinking about it together. That's a very interesting portrait, I think, of—. It reminds me; when I work in the engineering buildings, engineers are just staring at blackboards or whiteboards full of equations and they're just in a meditative concentration. So you fostered a different kind of atmosphere for your students. That's something that was talked about among your students: that you were never patronizing; you were never condescending. You would listen intently to the students' efforts to frame a question, and you would respond by saying something like, "let me see if I understand this correctly." Then you would explain it in a very succinct, elegant fashion, what it was they were trying to say. It was a form of pedagogy that people really respected, because I think, at least for some in that environment, it could take a chunk out of you. I think you provided a more supportive framing for the educational experience. Is that something that was part of your personality, or it's part of how you decided to approach teaching?

05-00:43:08
Tolley: It just came naturally, that's all.

Burnett: It's just a question of personality.

Burnett: So returning to *The Economics of Urban Amenities*, why don't we start with this more expansive notion of amenity? What is an amenity in this framework, and why does it have extra explanatory power over the existing ways of understanding the location of cities, the size of cities, and that kind of thing?

05-00:43:46
Tolley: Well, because it ordinarily is not recognized as being— It's not treated in the marketplace overtly, and so it's not paid attention to, unless you get it out and recognize how important it is.

Burnett: It's a kind of good, but it's a location-specific good. I think that's the definition.

05-00:44:20
Tolley: Well, let's see. I'm trying to remember my class. There are location-specific public goods, and that's a lot of what we're talking about in urban economics. Being a citizen of the United States is a public good. You can't buy or sell it. It's not ordinarily traded. But it's a public good. However, most things are location-specific. You can't get the ambiance of Chicago anyplace else but

Chicago. Well, the thing is, then, it has market consequences. But that's what you have to trace out.

Burnett: And that gets bid into the price of the location.

05-00:45:14
Tolley: Yes, exactly.

Burnett: Right. So that's the sense in which it becomes somewhat tradable.

05-00:45:20
Tolley: Yes, exactly.

Burnett: Right. So the amenities can be gained only by changing your location, so that's where the factor mobility or the labor mobility comes in. So it's an effort to develop a unifying concept that explains land values, patterns of density, and the locations of homes and businesses within cities. I think when you talk about a good that is location-specific, it's not fungible. It cannot be transformed into other things, it cannot be aggregated, right? What you do then is you take the work that you had done so far, and William Alonso and others, that you'd so far, folded transport and access into these other land values, basically, and made transport and access just a subset; it's another set of amenities. Right?

05-00:46:37
Tolley: Yes, yes.

Burnett: Another set of features of space, basically. So can we talk then about some examples that expand our notion beyond the transport costs, beyond the question of access to desirable places, the other things that are desirable that people are willing to bid up or down land values on?

05-00:47:12
Tolley: Well, could you give me a little more hint?

Burnett: I want to save anything environmental for talking about environmental things. So in terms of social policy, I think one of the striking examples was a chapter that was written by Barton Smith. It does have to do with the Muth-Bailey model, and he does some work with that, of housing discrimination. The Muth-Baily model is 1975, I think. It's a border model of segregated housing districts between African American and white districts and the ways in which white homeowners will bid up the price of living away from black people. Then the closer you get to the border of a black neighborhood, the lower the property values are going to be. So it's one of the more challenging parts of this type of analysis, in that it's talking about distance from African Americans as an amenity, right?

05-00:48:51
Tolley: Well, that's what it is.

Burnett: It's what it is. It's looking at it in a very cold, dispassionate way. But this explains some features of economic behavior and human behavior. So we were talking earlier about the tumult in Chicago and arsons. So people were torching their own apartment buildings to collect on the insurance.

05-00:49:18
Tolley: Right.

Burnett: One of the things that comes out of this economic analysis is that land values in the African American areas can be below replacement costs of the actual value of the home. So it creates a price incentive for people to destroy the housing. It's a heartbreaking part of the story of racial tension and unrest and inequality in the 1970s in major American cities. And here there's this analysis that says, this is why it's happening, without recourse to— It's not making any reference to history. It's blackboxing all of the history and the policy and the overt discrimination, hatred, that characterizes that problem, and it instead focuses on what is it that people are doing when they make choices to live in one place as opposed to another. He was trying, I think, to make—I don't want to mischaracterize it—this distinction between discrimination and prejudice. So rather than an overt discrimination against black people, there was a valuation of these desirable areas, expressing a preference. And he was trying to expand this notion of preferences to be not just a question of race; just to see it more demographically. That people like to be with people who are like themselves. This is in a context of policy. This is racial desegregation, this is the law of the land; but it has failed, largely, even by the seventies, and even despite pretty strong efforts to have a busing program that's actually physically desegregating the schools by moving students from one school to another—

05-00:51:42
Tolley: That's right.

Burnett: —despite even all the transportation costs associated with that. So it's an effort to get a handle on what human beings are doing when they're making these economic choices. I picked that one as probably the outlier, or kind of a limit case for how far you can take this notion of amenity.

05-00:52:09
Tolley: Well, I just want to add something that came to mind. A student, within the past two years, in my urban class [did a study]. They were destroying some public housing and they gave people vouchers to find a place to live that explicitly, no landlord would be accepted if they wouldn't accept blacks, a very strong antidiscrimination requirement. He followed up these people who were displaced, and the overwhelming majority, 80 or 90 percent, wanted to live in black areas. They didn't want to live in white areas. Which is sort of the same thing, that people have a taste for where they want to live.

Burnett: And there are amenities that are specific, that are racially specific, that are socially specific to races. So it's exactly what you're talking about, which in no way justifies inequality, in no way justifies the unequal treatment; but it does explain, on a kind of micro level on the margin, the choices that people make. Now, the question is, what do you do with that? It is also a limit case, where making good policy, when something is so over-laden with history, tragedy, and pain, how do you address that? That's something that is a challenge. Let me put that as a question. What can this type of economic analysis do, precisely, about those thorny political, social, historical questions that are really vexing for cities, absolutely to the present day?

05-00:54:34
Tolley: I wish I had the answer. I think the major answer is, you don't try to distort the market. That's the point. Don't try to second guess the market. You've got to accept what the market is telling you, and work with it. You don't necessarily accept it, but you recognize what's driving it. You don't pretend that that doesn't exist. So it's there and you just don't make mistakes with it.

Burnett: So Arnold Harberger talked about the market as winds and as weather, basically. So there are these trends. I'm now floridly elaborating on what he said. But there are these prevailing westerlies, for example. You can try and sail against that current, let's say, but that's going to get you nowhere. So you have to learn to use the current. If you're sailing a boat, you have to learn to use the current and go with it. So if there's a government policy, you can shape the direction of that. You can't go completely against the trend.

05-00:55:57
Tolley: Right.

Burnett: Is that kind of one of the basic, basic lessons that seems to come out of this period in economics, and Chicago as a leader of that kind of policy explanation? That seems to be the basics of it. Yes.

05-00:56:18
Tolley: I think it is. One thing, I don't know how many people we put down in Springfield [state government of Illinois]. Springfield used to have some very good people; I don't know about this present debacle. But they were hiring some very good people. My goal was to train people to go work in the state government like that and not muck things up. Because many people who get into those positions have no understanding of what's really going on.

Burnett: So there does seem to be a commitment that's maybe another feature of this subgroup, because Arnold Harberger is the same way when it came to doing consulting work for a lot of other countries. He just had this sympathy for these mid-level civil servants who needed some tools to deal with what is, just under the normal course of human activity, venal, logrolling work, bureaucratic inertia. This, "this is the way we've always done it; let's just keep doing it." So against those kind of bureaucratic tides, trying to show that there

are these market currents that are flowing around government activity; and government activity can harmonize with that, or it can completely run aground, if it doesn't pay attention to them. So you have an outreach animus, do you think? You're hoping that bureaucrats will take your courses, will read your books, will read your articles; that this will percolate out and make for good governance?

05-00:58:24
Tolley: Well, absolutely. I think that's the purpose.

Burnett: Yes. Because it's policy stuff. How many of your students would you say, Chicago products, end up in government policy or industry? Do you have an idea? Do you get feedback from either surveys or just anecdotally? A lot of your students have gone on to prominent positions as academics, usually with a kind of policy angle, usually with policy consulting. So is there a replication of a Tolley orientation to governance reform, governance competence, as a goal?

05-00:59:20
Tolley: Well, there probably is. I haven't counted, but so many of my students have gone into government and become very—there's Vinod Thomas.

Burnett: Right.

05-00:59:32
Tolley: Rose right to the highest civil service position that exists in the World Bank, and others. Rich Burkhauser was an interesting case.

Burnett: Of course, yeah. Absolutely. You can see this with D. Gale Johnson and T. W. Schultz also. Al Harberger is chief economist of the World Bank for a while. Justin Yifu Lin, who was either D. Gale's student or T. W.'s student or both. The story is that he's T. W.'s last student.

05-01:00:16
Tolley: It could be. I knew him very well. I worked with him, too.

Burnett: Great. Well, we'll talk about him. But he stepped down as chief economist for the World Bank in 2012, I think, and then he's written a number of books about development. Vinod Thomas is the managing director of the Asian Development Bank. I think that's right.

05-01:00:48
Tolley: Well, he was head of evaluation at the World Bank, and then he was—. When you take that position, you can hold it for only six or eight years, and then you're automatically out. So then the Asian Development Bank immediately hired him. He retired a couple years ago, probably.

Burnett: He's visiting professor at Lee Kuan Yew University [Lee Kuan Yew School of Public Policy].

05-01:01:16
Tolley: In Singapore.

Burnett: Yes.

05-01:01:18
Tolley: Yeah, right.

Burnett: We should certainly come back to talking about urban economics as we go through this period, but I just wanted to get a sense of the consolidation of the field. I think at the beginning of the establishment of the field, there's this explosive creative period, when people are pushing the boundaries to figure out, what are the contours of how far we can we take this? Is that what the '82 volume *Economics of Urban Amenities* represents? Was that an effort to say, what is the total set of things we can include in this thing called urban economics?

05-01:02:20
Tolley: Well, that's part of it, but it's not a book on urban economics. It's really a plea to make amenities a very key part of it, which frankly, it was not, among many economists. It was natural for me to get into the environment, because I'd been interested in natural resources and water, and if there was a place where environmental economics started, it was there. But that volume was about amenities and trying to call attention to it.

Burnett: But is it about expanding an understanding of what the object of study is?

05-01:03:17
Tolley: No question.

Burnett: Right.

05-01:03:18
Tolley: Is that where *Urban Growth Policy in a Market Economy*—?

Burnett: This one? No, it's 1979, that one. This is '82. *Urban Amenities* is '82 and *Urban Growth* is '79.

05-01:03:35
Tolley: Yes.

Burnett: Yes. That is kind of the state of the field, isn't it, at that time, '79? It included your insights for "The Economics of City Bigness," for example.

05-01:04:02
Tolley: Right.

Burnett: So that felt like a consolidation of, here's this field, in '79. *Urban Amenities*, in '82, was, how far can we go? So what I got out of the '79 volume is, I was trying to get a sense of what is the positive policy? I think there was a lot of,

don't do this and avoid this. But really, trying to just actually explain the toolkit and what it could do. But I did want to zero in at the end. This is Philip Graves, isn't it? But the basic thrust of that volume was to elaborate a methodology for making policy that involves choice among locations. So you and your coauthors are in favor of a population distribution policy. That's one. The basic orientation was to end policies that have inadvertent centralizing effects: state and local financing methods, a minimum wage policy, or welfare payments. Not that there shouldn't be those policies, but—correct me if I'm wrong—you don't want those policies to reach a threshold where they have a distortionary effect on the size of the city.

05-01:06:38

Tolley: I don't recall saying that exactly, but that's certainly consistent with the whole idea.

Burnett: Again, I focused on social policy because I wanted to then do a separate take on environmental. So this argument was that the minimum-wage policy, welfare payments, and so on encourage the concentration of the poor in cities, that then leads to more ethnic and income separation. I guess I was struggling with the welfare policies causing the inequality. I know this wasn't what was said explicitly, but the causation chain is that if you have a minimum-wage policy—it's a Malthusian argument—you're going to make things more attractive for poor people and they're going to stay there, when in fact, if you let the markets do what they were doing, people would leave and take work and take opportunities. I think there were maybe some assumptions in there about the nature of poverty. But at any rate, what I found interesting here—. And you may be able to draw this up to the present day, because minimum wage is again in the news and it's in policy recommendations. People are doing it at the municipal level; they're doing it at the state level, of course; and then there's this call for a federal minimum wage of fifteen dollars an hour. So if there's no elimination of the minimum wage, set real wages according to city and regional price variations. So in a sense, if you were going to do the screening practice of good economics, instead of saying you don't want a federal minimum wage, if you had to have a minimum wage, you would want it to be a local one. For example, the Bay Area, which has this highly inflated economy. So choosing between the two sets of policies, you would say absolutely that a minimum wage for a city or an area where there's higher prices, you would tie it to the real wages of the area. So if people are making more money in that area, you would have a minimum wage there.

05-01:09:02

Tolley: All right.

Burnett: Okay. So I think the volume ends with questions. Because you know that this is a better set of tools for understanding the dynamics of an urban economy, but I can see the authors are reaching this point where, can you address the thorny questions of income inequality or the issues surrounding segregation or

desegregation? How do you optimize something that is so laden with social and historical questions or problems? This is ultimately about using sophisticated mathematics and modeling to understand complex dynamics in society, with a recognition that there are limits to our understanding of complex social problems and our ability to provide solutions to them. So there's an element of policy humility that I see, both in the urban economics side of things and the environmental economics side of things.

So we can maybe use that as a segue to return back in time—not so far, but—to the environmental economics sides of things. So there's a volume that we'll talk about in a later session, *Electric Energy Availability and Regional Growth*. It's a very particular case. But I want to frame this in terms of the series of which you were the main editor. The Ballinger series, at the beginning of the seventies, is *Studies in Environment and Urban Economy*. You can see right there, the name of the series twins urban economic and environmental economics; there of a piece for you. There's a second series, a Ballinger series, that begins to come out in '81. *Environmental Policy*, is what it's called, and it's a five-volume series, begins in '81. The first one is *Environmental Policy*, that gives a kind of scope of the field and the challenges of the field. This is with Glenn Blomquist, Philip R. Graves, and you. So the other volumes are actually on discrete policy buckets—air, water, solid waste, and recreation. So I want to skip ahead and sort of talk about some of the basic lessons that have been drawn from this kind of research. Do you want to say something about, by the end of the seventies, what the scope of the field is, what the basic tools are, and then what the lessons learned are, that are different from the kind of environmental policy world that is outside of it?

05-01:13:11

Tolley: Well, that's a big order.

Burnett: Yeah. no, it's a tall order. I'll just maybe start off. I think in some of the conclusions—. And this is absolutely consonant with the narratives I get from industry, when they're talking about this period. The Environmental Protection Agency is 1970, and there's the Clean Water Act in '72. There's this initial regulatory expansion, and demands to meet requirements. But everyone is trying to build this airplane while it's taking off from the runway. So the regulators are trying to figure out, how much can we ask for? And the industry is trying to figure out, how much can we pay for this without going bankrupt? They're kind of negotiating back and forth. And it wasn't so rosy; there were also a lot of lawsuits—

05-01:14:26

Tolley: That's right.

Burnett: —and countersuits. So a lot of environmental protection laws were just kind of hung up in the courts by then; nothing had really been decided. So by the

end of the seventies, you're trying to take the temperature of the regulatory space and say, this is what we've learned. If I could boil it down to its essence, your basic advice is flexibility, and that you need to approach things on a case-by-case basis. So in some cases, you might say that instead of having a uniform standard—this amount of pollution; this is the only thing we can tolerate is this many parts per million of X—. You're saying it depends. Why would you say "it depends?"

05-01:15:34
Tolley: Well, I suppose the first reason, it depends on how many people there are there. If you're out in the desert and there are almost no people, you're not going to have as much gain as if you bring it here. In the city of Chicago, they finally closed the old coal plant that was down there on 21st Street, in the past couple of years. But it was going the whole time and it was spewing out so many particulates, the disease rates from that, the amount of disease from that, was much higher than some of those plants out in the Four Corners area, for instance.

Burnett: Right.

05-01:16:16
Tolley: Incidentally, I think we found it very, very difficult to vary these standards that way. We argued and argued for it, because it stares you in the face if you're thinking about the benefits. But anyhow, that's an example.

Burnett: I guess because there's a regulatory cost, it's cheaper to have a uniform standard?

05-01:16:42
Tolley: I think it's political.

Burnett: Okay.

05-01:16:46
Tolley: The people of Chicago, why should we have to bear greater costs than the people out in Colorado or wherever it is?

Burnett: So there's an appeal to fairness. There ought to be a kind of economic rejoinder to that, right? Because that's exactly benefit-cost analysis. But you're saying, this many hospitalizations, this much cancer. Poorer people are living closer to polluting plants, and so therefore they're going to be on Medicaid, and so the taxpayer's going to be paying for this. So wouldn't it be better to have some kind of regulation that would help to cover some of those costs?

05-01:17:35
Tolley: Yes.

Burnett: But that doesn't happen.

05-01:17:37
Tolley: Well, it doesn't happen.

Burnett: Okay. I think there was a call—let's see—in response to the uniformity of approach to pollution or poor certainty about effects, right? In that case, you're going to wind up in the courts, with an industry saying, you can't prove that this has this particular impact.

05-01:18:11
Tolley: Yes.

Burnett: We get a debate about that and it just goes on forever. So a solution that you three proposed are temporary variances. I don't know the mechanism of temporary variances, but I imagine it's making compliance flexible if the costs are prohibitive or if the proof is weak. So you're developing these kind of policy tools for negotiating an optimum outcome. Just not saying, in the absence of fiat, in the absence of a regulatory agency saying you will do this, and then meet that or else, you're always looking at it as, this is in a larger economy, and this policy will have this effect; it will depress this or that. This will depress wages or it will result in a wage rise, or have these other knock-on effects, and that you must take that into consideration. That becomes your broad-based policy advice, when you're talking about environmental policy.

05-01:19:30
Tolley: That's certainly true, but I would like to point out we did not focus on policy advice. We were just trying to get in the techniques of how you estimate these things. It's more of, if you will, a technical assistance thing.

Burnett: Okay. Yes. Well, technical assistance. I think that's a good way of putting it. I think there's even one chapter, how to write an environmental impact report.

05-01:20:06
Tolley: Yeah.

Burnett: So it's a very compact book, but it is a kind of higher-order manual for how to approach thinking about environmental policy problems, not a particular policy position. I didn't mean to suggest that. But you're saying as economists, what have we learned about this regulatory process that will allow us to develop tools for the working out of policy that is most economic?

05-01:20:46
Tolley: That's it exactly.

Burnett: Okay. So that's, I think, what I wanted to play with. You talk about good examples. Make benefit-cost analysis part of the permitting process, so that you could then distribute polluters across different areas, because you mentioned the concentration of polluters in particular areas. Although I imagine there are economic reasons why there's the colocation of polluting industries.

05-01:21:22
Tolley: Well, sure.

Burnett: But all other things being equal, if the permitting agency can then say, well, we'd rather you were over here, so that the pollution doesn't concentrate in one basin and choke everybody out. So that would be one thing. You mentioned the EPA's bubble approach, which was to allow polluters to choose the mix of tools they would use to reduce a kind of single variable of pollution outcome. So it gives some freedom, and assumes that the polluters know best their mechanical and engineering operations, or sort of the scientific side of what they're doing; puts the freedom on them to achieve a particular target. EPA sets the target and says, how you go about that is fine with us; just reach this target. The tools that you're advocating, the general pattern I'm getting, is flexibility is going to give you some of the best outcomes. Flexibility in terms of not saying it's a particular amount; saying you have to respect the ecosystem, you have to respect the environment in which the pollution is taking place, you have to respect the capacity of the polluter to achieve the goals. So there's an economic ecosystem in which they're operating, to ensure the best and most effective compliance? Does that ring true to you?

05-01:23:19
Tolley: Well, absolutely.

Burnett: Great. When I started with urban economics and environmental economics it's the same thing; examples of bad regulation. The overwhelming sense I got from reading this work is that uniformity of approach is the death of things. It just really, really is a non-starter. So people need to be adaptable and approach things in a sophisticated way.

05-01:23:52
Tolley: Yes, absolutely.

Burnett: Okay. So again, this is the kind of development of a field of research in economics, and you're kind of staking out a claim for what it is, as opposed to any other type of way of approaching economics, environmental economics. So as is customary with the formation of disciplines, there's a journal. And this journal has a particular trajectory to it. So I'm wondering if you could talk a little bit about the foundation of *Resource and Energy Economics* in 1978. Who's involved? What was the purpose of the journal? What were some of the roadblocks that you encountered? And how did that unfold?

05-01:24:54
Tolley: I suppose it was Elsevier. I don't know who was the impetus for that. But then there was a group of us who met, and it was myself, it was Steve Berry, and it was his colleague, who I worked with quite a bit. I'm still blocking on his name. Then there was a couple of people from Europe. So we started this journal. It was to be interdisciplinary; there's no doubt about that. It ended up

being largely economics, because we found out, as I was saying before, that the articles submitted from Europe were not of sufficient quality—

Burnett: It's a long time ago, but can you say a bit more about what the low quality—? What where the qualifications of that low quality? They weren't sufficiently rigorous?

05-01:26:11
Tolley: I think probably they didn't have sufficient economics in them. The problem is, it inherently involves economics and if you don't bring that in, then you've lost what you're trying to get it.

Burnett: Right. So it's less interdisciplinary and more just multidisciplinary. There were different disciplines represented in the journal, but they weren't talking to each other?

05-01:26:34
Tolley: Well, I wish it was that good. I think it was disciplines of non-economists trying to preach economics. It would go into that kind of a problem.

Burnett: When I was teaching up in Canada, there was the economics department, and they were doing largely environmental economics. It was a liberal arts college.

05-01:27:03
Tolley: Where was it?

Burnett: In New Brunswick, St. Thomas University. So some of that has evolved into moving beyond your economics heritage and developing new tools for understanding the environment and new ways of understanding, outside of the price system, for example. So instead of bringing the externalities into the price system, you're bringing the externalities and giving them pride of place. That was a basic impression I was getting of that. So environmental economics, to some degree, begins to veer off in some of those directions? Are you familiar with literatures that are outside of the kind of work that you were doing, that would call themselves environmental economics?

05-01:28:28
Tolley: Well, a little bit. There's ecological economics, for example.

Burnett: Right.

05-01:28:40
Tolley: There may be something interesting there. The articles I've dipped into, I haven't found it yet; but the idea is very interesting. Anyhow, we're back in 1970 or whatever it was. This did not reach that level of sophistication at all.

Burnett: So they're just not doing research that can be adapted to the kind of economic frameworks that you were looking at. It was just not there. So the contributors

from Europe, do they continue for a while, but then it just falls off after a time?

05-01:29:30
Tolley: Well, that's what happened; I forget how. There were a couple of unfortunate meetings where they were—. It was always civilized. But anyhow, it just reached a parting of the ways. We said, we just can't live with these articles.

Burnett: It's formed in 1978. Are you saying that there was an earlier iteration of the journal that then—?

05-01:30:09
Tolley: No, no.

Burnett: Okay. This is when it begins—

05-01:30:11
Tolley: Yes, right.

Burnett: —in '78, and there's this other team from Europe, or a set of contributors. And then after a number of years it falls off, and there's a renaming of the journal. Is that the point at which you reclaim the space?

05-01:30:28
Tolley: Probably. I don't remember exactly, but I would say that's probably right.

Burnett: Okay. So that's a part of discipline formation. It's initially this interdisciplinary approach; but if you felt like the disciplines were not—. [If] there was no exchange really and they weren't learning from you and you weren't learning from them, it was just best to go your separate ways.

05-01:30:52
Tolley: Right.

Burnett: So environmental economics has this benefit-cost analysis orientation where the price system is the center. I don't know if that's fair to say. The price system is the kind of governing principle, at least. So the things that are not in the price system can be rendered legible according to the price system.

05-01:31:28
Tolley: Perhaps.

Burnett: I don't know if that's clear enough or not, but that's my kind of basic interpretation. If you're going to do benefit-cost analysis, you're going out to find analogs —. To take an example of Glenn Blomquist's work on seatbelts, that's one kind of actuarial conception of human life, right? So then you price human life, or you price a shortened life, and then you can apply that to pollution, right? So is that an example of the kinds of ways in which you can take an externality—so pollution has this effect—and say, what are the

healthcare costs of pollution? Now, one of the things that came out in an article just a couple of days ago was the effect of a polluted environment on the educational attainment of children in a polluted environment, and so you've got those costs to deal with. So you can then develop a price at which a given environmental intervention or policy intervention is going to be effective or affordable. Is that a fair characterization? Or is that too narrow for what environmental economics is to you?

05-01:33:04

Tolley: Well, you're getting into the value-of-life literature now. The question is—. You're certainly going to affect lives with these decisions. So a certain number of people's lives are lost because of the pollution, and if you cut it back a certain amount, a certain number of lives are going to be saved. So if we take the newspaper editorial view, we should have zero pollution, because we don't want anybody to die. Well, it's not practical. So what do you do? So you go to what other people have revealed. Then we get into revealed preference. Now, people don't really think life is infinitely valuable. They take precautions, but they don't go all the way. So you look at what they do and get indications of the values that people apply to this. I think there is—. this goes back to Anglo-Saxon economics, I don't know. You accept people's tastes and that's your guide. You find out how people value these things in other ways and you say, that's going to be our guide to what we should do here.

Burnett: It's often said that Gary Becker is famous for expanding the field of economics beyond the traditional domains of price and efficiency, etc., into these domains such as the rational choice behind drug addicts' decisions, family decision-making and so forth. For the critics, it's this colonization of fields that had hitherto been dealt with by sociology or social work or political science, and it's this, "Chicago is on the make to colonize the whole social sciences." So Gary Becker arrives, I think, in '68. But what I'm hearing is that the benefit-cost analysis group that is the agriculture folks and Arnold Harberger and you are working on expanding the domain of rational economic thinking to these areas of externalities, bringing that into the fold, making that an area of policy analysis, of economic analysis. So perhaps we can say that this expansionist notion of Chicago economics, going out into new fields and new domains, creating a version of urban economics and environmental economics, it's already there by the time that Gary Becker arrives. There's a context. Of course, he was going into new areas in the fifties, but there was already a context in which that type of economic exploration was happening in Chicago. I think that's fair to say.

05-01:36:55

Tolley: It is fair to say, but we can't short Gary Becker. He did revolutionize things. This group that you're talking about was not doing that, although I would say this work in urban economics was quite a departure. But it was not these really new models that—. I was really, and urban economics, was bringing

traditional classical economics to areas where it had not been brought. He was extending it to other areas even.

Burnett: I know that you cite him in one of your 1971 papers. Was he an inspiration to you while you were—. Of course, he's a younger scholar and you voted to have him join the department, even though he was working in a different domain. Maybe not just him, but other Chicago folks outside of your team of T. W. Schultz and D. Gale Johnson and Margaret Reid and so on, were there others who were inspiring to you, even though they were working in different domains?

05-01:38:13
Tolley: Well, this was mainly the group. I was certainly always a fan of Gary's, and then when he'd started his rational economics workshop, I always attended that. I became quite a Beckerite.

Burnett: So inspirational, stimulating, thought-provoking.

05-01:38:36
Tolley: Yes, but it was later; it was not in this period.

Burnett: Well, I want to keep track of everything here because you were working in many different domains at the same time. So there is more international consulting in the seventies. In '76, '77, you're doing some work for USAID. You do some work in Panama for the Ministry of Planning, and for Venezuela. Can you talk a little bit about what you remember from those things? Let's take Venezuela, for example. What were you working on there?

05-01:39:18
Tolley: I think what had happened was that they were running out of food, because they didn't understand some very basic things, like you've got to pay the world price if you're going to do it. They wouldn't let the price of food go up in Venezuela and somehow, they weren't subsidizing imports, so they were running out of food and it was an emergency. Jonathan Sunulian called me up, and we went down there and tried to educate them to the effect of that. It's not easy. People don't want to see those things. But we hired two or three people who worked there for some time. I would go back and forth quite a bit. That was a fairly big effort on my part.

Burnett: What was it like working in a policy context which is so different from what you're used to? They're saying price controls, they're pegging it, keeping the price low, sort of as a populist measure. I imagine the same with the [Hugo] Chávez regime and later, to this day. That's the kind of problem that they're wrestling with. The lesson may have been learned for a while, but it got forgotten again. Can you talk a little bit about what it's like to communicate those ideas? I guess they were receptive because they were running out of food and they were willing to listen, but—.

05-01:41:07
Tolley: See, it was not the extreme government that's there now; it was not a communist government at all. It was a democratic situation. I don't know what party was in power. I think the people that I met with, that we met with, were very interested in what we had to say. I think they learned quite a bit from it. We were not in the politics of the situation or anything. We didn't know how to convince the public at large or the political system to do these things they needed to do. But I believe we helped a great deal for the people who were close to the decisions, who understand what would be needed.

Burnett: But you also did some consulting in Panama. Was that also agricultural or—?

05-01:42:18
Tolley: Well, that was more on the general development of Panama. That was a very interesting experience. It was not intensely devoted to political situations; it was more just trying to understand the economy of Panama. I learned a lot from it.

Burnett: It must be [an] incredible experience to go to different countries and just get a whirlwind tour of, this is the economy, this is how it's structured; what can you do to help us? That must've been really educational for you.

05-01:42:58
Tolley: Well, the Inter-American Highway was down there, and that was having a big effect. Then there's a town—I forget the name of it—it's in Southern Panama. The people are incredibly industrious. It was a puzzle of economic growth. Why are there pockets like that where people are so different? And other things. Panama has been through the wringer with the Panama Canal. When there was a canal, it was very prosperous. Then when there wasn't, it just went to pot and so forth. Very interesting. Oh, we just learned a lot.

Burnett: And there was some consulting for World Bank in '76 and maybe '79?

05-01:43:54
Tolley: Well, let's see. Later, I went to China for the World Bank, on urban problems. I don't know whether that's in your notes or not, but anyway, we did quite a bit of that. Worked with the urban people of the bank, did some very interesting things there.

Burnett: And that was '79?

05-01:44:17
Tolley: I think that was later; I'm trying to recall '79.

Burnett: I think T. W. Schultz and D. Gale Johnson both go to China to deal with agricultural questions right as they open the special economic zones. The opening is '78, and I think they're there in '78, '78. And they saw a relationship.

05-01:44:38
Tolley: I was not involved in that. I followed a lot of that in the ag workshop. There were Chinese people there working on theses in that area.

Burnett: Right. That becomes a feature later in your career, and we'll talk about that in subsequent sessions. But you develop expertise, and then also cultivate some graduate students from Asia. That becomes part of your work.

05-01:45:12
Tolley: Yes.

Burnett: You have another burst of graduate students in the nineties, right? So that's another story that we want to cover. The late seventies is also yet another beginning for you, and that's the rise—or the establishment, rather—of a private consulting firm. Can you talk about the evolution of that? How did that get started and who was involved?

05-01:45:40
Tolley: Well, yes, I had this friend, Marshall Kolin. He was in the social group here. He and [Andre] Gunder Frank were the only two people in this wider group, let's put it that way, who I was very good friends with. So then Marshall went to New York. Everybody's different. So he was not the best-organized person in the world. Like a lot of people around this university, and I'm sure around Berkeley, a lot of brilliant people are sometimes never quite really bringing it all together as you hope they would. Anyhow, then someone hired him at the U.S. Postal Service, and he went there. Pretty soon he was calling me up for help, and then finally hired me as a consultant, and I appeared as a witness for their regulatory proceedings. Well, anyhow, so finally, I was apparently quite good at it, so it became a very continuous thing. I had a postal contract, beginning in '78, to this day. So then we became their think tank, I guess. What it was, what we found out is, we could hire better people for what was needed than they could do in Washington. I'm never quite sure why that's true. I think over in Treasury, they could have very good people. Anyway, so that's the genesis of RCF [RCF Economic & Financial Consulting, Inc.]. Then later on it expanded out and—.Then I did a lot of work with Argonne. First I was doing it at the university, and then somehow it just—. Quite independently, the people of Argonne knew about me, so we started doing work on energy, and we've been doing that for a number of years now. Worked on the hydrogen problem. That has been a big focus of it.

Burnett: Wow.

05-01:48:17
Tolley: The adoption of new vehicles. We did a lot of interesting—well, analytically interesting—work in that area.

Burnett: Well, I do want to dive into that, I think, because RCF is still going.

05-01:48:36
Tolley: Yes.

Burnett: Are you still its current president?

05-01:48:39
Tolley: Yes, I am.

Burnett: So we should keep track of it from now on, as we go into the next set of sessions, and when there are kind of related questions or—. Because you're going to be learning things from your consulting work that are going to inform your economic work; your economic work is going to inform your consulting work. So we can sort of keep that in parallel, I think.

05-01:49:03
Tolley: Yes.

Burnett: So what I think we should do is, in the next session we'll really talk about students that you mentored in this period. This was an intense period of mentorship. We've talked about the subject matter and the volumes that came out, but the role you had in these figures' lives and how some of those relationships developed, right? So you started at the students, and then they become colleagues, and they come—. I think some of them are in the RCF consulting world; is that right?

05-01:49:46
Tolley: Some of them. Not many, but some.

Burnett: Yeah. So they are figures that continue on in your life, and so we'll use that as the bridge to the next set of sessions.

05-01:49:58
Tolley: Okay, and we need to—. You were mentioning '76 or so and the World Bank.

Burnett: Yes.

05-01:50:03
Tolley: We need to go back to Vinod Thomas. I think that was—. There were problems still in agriculture, with Vinod. We did a book on agricultural price policies in developing countries, and then we did some urban work, too. Anyhow, so that'll come out in all this.

Burnett: Yeah. I think we should cover that because I think the first World Bank report with him is '82, and then there's another one in '87. So it's a 1980s story.

05-01:50:33
Tolley: Yeah, okay.

Burnett: Okay. Perfect. Well, we'll take that up next time.

05-01:50:36

Tolley: Great.

Burnett: Thanks.

Interview 6: June 4, 2018

Burnett: This is Paul Burnett interviewing George Tolley for the Economist Life Stories project. It is June 4, 2018, and we are here in Hyde Park, Chicago, and this is our sixth session. So we last left off a couple of months ago now, with you in the 1970s, having moved urban economics and environmental economics forward. One of the things that one of your students said, and it rang true, is that at least at the time, you were one of the few Chicago economists who was active inside the Beltway. He's talking, of course, of federal policy making. But also at the state level in Illinois, and at the municipal level, you did consulting work for the Environmental Protection Agency, and by the end of the seventies, you had formed RCF Consulting. There's one project that we didn't talk about from that period, which was a study you did for the EPA in 1978. It's about solid-waste disposal in Chicago and the development of a theory of demand for solid waste. I think the larger context is an interest in the rising cost of waste disposal, but also this environmental context in which reducing waste becomes more and more important. Can you talk a little bit about the inspiration for that project and how it's situated in the larger context of research that was happening at the time?

06-00:02:38
Tolley: All right. I'll try to remember what the genesis of it was. I do remember I worked very closely with Joe Havlicek, who was, at that time, in Indiana, at Purdue [University]. I had known him, worked with him on the TVA, when I was still in the South. I forget who sponsored that; I guess it was the EPA. But anyhow, the idea was that waste is a commodity and you can analyze it in terms of demand and supply, and externalities, very importantly. We spent a lot of time visiting dumps.

Burnett: You did?

06-00:03:27
Tolley: Yes. Oh, yes.

Burnett: Okay. So this is something that is often rendered invisible in economics research, because to read some of the studies—not necessarily yours, but those of others at the time—you get a sense that modeling is so important, the sense that a direct encounter with the object of study is missing. So can you tell me about some of these visits to dumps?

06-00:03:59
Tolley: I want to say that what you've just pointed out is a feature of agricultural economics, and that's to go look at the phenomenon. If you haven't seen it and don't understand it, you really can't pretend to analyze it. Well, let's see. It still stands out in my mind. There was this dump out in the country and there were these houses right along beside it. This housewife was there. We asked her about it, she rented it. She said, "This is awful." What we still couldn't

understand was, why did they choose to live right by the dump there? I still don't know. Then—I'm just free associating—I was in Mexico City. We went out and looked at the dumps in Mexico City. What we found out there is the people were living right in the dumps, because they were making their living by gathering the waste and selling it. Then we went around the Chicago area and saw a lot of disgruntled residents. We did a regression analysis for it. I think that was in the Chicago area. We found out that if you were downwind from the dump, your property values were markedly lower than if you were not downwind. So we did a lot of that kind of thing. We studied pyrolysis, all the different ways of getting rid of solid waste. I guess we attracted a fair amount of attention, because we were the first people who had looked into this, solid waste as an environmental thing.

Burnett: In the nation or in the area?

06-00:06:14
Tolley: Well, we did most of our work here in the Midwest. I was here and Joe was at Lafayette. But no, we went before the AFEA, the [American] Farm Economics Association, and presented our results. So yes, I think we were the first in that.

Burnett: Did you get an answer to that question about the housewife who was living on the edge of the dump, in your regression analysis, that the price was bit into the—? Her choice to live there was a bit related to necessity, perhaps, it was probably pretty low-cost housing, I imagine.

06-00:06:578
Tolley: It must've been. It must've been. Yeah. I'm being facetious. It might've been her husband's decision.

Burnett: Right, who knows? What was your reaction when you saw and understood that people in Mexico City were living off of and in the nuisance grounds or dump sites?

06-00:07:26
Tolley: Well, then we said, that's terrible; but they're living as well off or better off than if they were on a farm in Mexico. It was labor supply and demand, really. Of course, who knows the disease and so forth that they were exposed to.

Burnett: Yeah, I don't know. But that's an interesting comparison of the rural to city standards of living that we often sort of miss and take for granted.

06-00:08:02
Tolley: Right.

Burnett: It's not often said, but I remember asking D. Gale Johnson's daughter, Kay Anne Johnson, I asked her about her father and she said he was an agricultural economist who knew how hard farming was and knew how challenging it

was. So there's not a romance around preserving a particular way of life; he felt if people have a chance to do something else, they should take it.

06-00:08:39
Tolley: Yeah, right.

Burnett: But that's an interesting perspective because not all— there's whole movements around a kind of romantic— well, there has *always* been a romance around the land, right? Returning to it and doing something new with it and relating to it an emotional and spiritual way. But there wasn't so much romance coming out of Chicago ag economics with respect to this, it's probably fair to say, I think.

06-00:09:08
Tolley: I was on the faculty here, and then I went to North Carolina State and I tramped around on the farms. So many of the people were going to the cities. That's where I first picked up an interest in urban economics, because they were doing that.

Burnett: I want to pick up on something that had to do with this study, and many others you've done, and that is regression analysis. Can you talk about regression analysis? In part, because it's something that becomes really advocated in agricultural economics. Ted Schultz is a big advocate; so is Henry Wallace and others in the 30s on through. Can you talk about regression analysis as a tool, its power? What can you get from regression analysis? What are some of the pitfalls? Can you remember an instance where something went wrong with an analysis? What's tricky about it?

06-00:10:23
Tolley: Oh, right. Well, it's absolutely fundamental. We talked about this a little bit last time. It goes back to Mordecai Ezekiel, there in the Department of Agriculture. He originated a lot of these [techniques]. Actually, it came out partly from the experiment stations and the Land Grant Colleges. They were planting these new varieties and they wanted to keep careful estimates of what the effects were. Then social scientists came in and they said, "Well, this is just what we need. We need objective analysis." It is absolutely fundamental to objective analysis. It still is. The techniques have gotten fancier and fancier, but it's still a fundamental tool. I think that agricultural economics was responsible for bringing that into economics generally. As you probably know, Ted Schultz came here and started the workshop system, and other people—Milton Friedman and others—took it up. So the workshop system became prevalent here in Chicago, and then it was recognized to be so important that it was copied. Now it's copied all over the place. Much of it involves empirical research, and empirical research almost always involves some form of regression analysis. It's fancier than it used to be, but it's still the same thing.

Burnett: Right. The processing power, the computing power is much greater now, and that makes it easier.

06-00:12:08
Tolley: Right.

Burnett: Are there problems? Because you still have to infer from the regressions. So you're taking a dependent variable and you're regressing these independent variables against it. You want to assess the degree of contribution of these other variables to the trend of that dependent variable. Is that roughly right?

06-00:12:34
Tolley: Yes.

Burnett: Okay. So when you're trying to draw conclusions, you're looking at the strength, the relative strength of correlation of these different variables on this dependent variable.

06-00:12:51
Tolley: Yes.

Burnett: Okay. So ultimately, you're trying to draw some conclusions about causation. So is there special advice or wisdom you gather in moving from that step between assessing these correlations and determining some kind of causation?

06-00:13:21
Tolley: Well, to me, you're speaking of the classic problem; and that is, the economists are interested in supply and demand and they're regressing price on quantity or quantity on price. That, for several years, was very—it still is—a fundamental question. This is the simultaneous-equations-bias question, and the best econometric minds on that. Again, a lot of it really originated here in the Cowles Commission. Are you getting into the Cowles Commission at all?

Burnett: Yeah. Any information you have about the Cowles commission is very welcome.

06-00:14:16
Tolley: Well, that's the kind of question. I think there was Henry Schultz. He was one of the original econometricians. He said, "Well, I'll try regressing price on quantity." Then he said, "I'll try regressing quantity on price." But he didn't really solve the problem. So we get into the simultaneous equations estimation, and it's kind of fundamental. If you're going to study supply and demand, you have to know what's influencing what. When the price or the quantity changes, is it because the demand curve or the supply curve shifted? You have to build that into your model, in order to get sensible results. This was at the heart of much of the work. When I was a graduate student, it was all developing. I think it's more taken for granted for now.

Burnett: So in order to determine—or decide maybe is the better term—in order to decide which is doing which, do you rely on other—? Is that what you use other variables for, to give you a clue as to what is the driving force?

06-00:15:52
Tolley: Well, that's exactly right. To make sense of it, you need to know whether—. Here you have a variable. Let's say the household income. That variable, you have to decide whether that's shifting demand or supply. It usually is shifting demand, in this case. I've picked a simple case. Then you have the weather, and that's usually shifting supply. Let's see if I can remember the trick; it's fundamental. Suppose it's the weather. If it's shifting the supply curve, then that means that the change that you're observing is the price; then you're moving along with the demand curve. So the omitted variable tells you what's shifting, and therefore, whether you're measuring changes in demand or in supply, the fundamental idea is incredibly simple, and it manages to get some pretty fancy techniques involved in it.

Burnett: Right. So that could probably occupy several hours of teaching.

06-00:17:32
Tolley: Yes.

Burnett: From time to time, I might ask you to put your teacher hat on, because it's really fascinating to hear your explanations of these complex phenomena, and also the history of it. Where did it come from and who was talking about it? How did it develop and evolve over time? So there's lots of regression analysis in most of what we're talking about today, at least.

06-00:17:59
Tolley: Right. There's Hans Theil. I don't know if you—.

Burnett: Yes.

06-00:18:05
Tolley: I remember hearing one of his fundamental lectures on this. There're several major insights. I use econometrics, but I do not advertise myself as an econometrician.

Burnett: Well, we interviewed Lester Telser. So he talks about Hans Theil a lot, so we'll flesh it out. We'll get there. So there's always a context for these kinds of studies. What was interesting to me, I think the original sponsor of this, through the EPA, is the Municipal Environmental Research Laboratory. Does that ring a bell? At any rate, they wanted to elaborate a theory of demand for solid waste disposal. In the report, you mention a 1971 Shaeffer-Tolley study, the gist of which is that future waste needs can be evaluated in terms of past trends. But you update that in this report, and you say you must not only consider the production of waste, but also consumption patterns. It just strikes me at that time, the European Union, in 1975, was coming out with this

pyramid of interventions — and it's basically reuse, reduce, and recycle. It's in the air at the time. When you're doing this kind of work, are you picking up on the larger zeitgeist or were you conscious of that? Were you paying attention to the development of new state agencies and the reports that were coming out of them? Did you see this as part of the movement to recognize environmental limits and efforts to address them?

06-00:20:13
Tolley: Well, it was a part of the concern with the environment, there's no doubt about that. I think maybe one would say it's in the air, is what it did. We wanted people to understand where solid waste comes from and the behavioral aspects of it and the environmental costs involved in it.

Burnett: So one of your former students talked about your passion for developing tools and working with people to develop sophisticated policy analysis, so really trying to reach out and help people in the policy making world. This particular voice talked about common political sense. So you have this common political sense, in addition to being an economist. In addition to that, you have this kind of awareness of the real difficulties of policy, developing useful, workable, and sustainable policy interventions. So to that end, you were moving that forward at the University of Chicago. What was pointed out is that in this time and in the years after, a lot of the major universities were developing public policy schools, Berkeley and many others.

06-00:21:59
Tolley: And here.

Burnett: Yeah. Well, later here.

06-00:22:02
Tolley: Later here, you're right.

Burnett: Because the Harris School is, eighties, that it comes out? [1988]

06-00:22:09
Tolley: Maybe, yeah.

Burnett: So that was his point, that Chicago was late to the party when it came to public policy education. He notes that here is George Tolley doing this at Chicago in the 1970s. So we did talk a little bit about this, but you were trying to build urban economics and environmental economics up institutionally here and on the national stage. So in 1968, you founded the Inter-University Committee on Urban economics? Or you co-found it?

06-00:22:56
Tolley: Probably neither. I was an initial member. There were thirty or forty of us.

Burnett: Okay.

06-00:23:06
Tolley: I don't know who the moving force [was]. I certainly enthusiastically joined it, but I don't know who did that.

Burnett: You were on it from 1968 to 1980, so it's for this formative period in urban economics.

06-00:23:22
Tolley: Right.

Burnett: From '75 to '92, you're on the editorial board of the *Journal of Urban Economics*.

06-00:23:31
Tolley: Right.

Burnett: So there's this institutional work in building up a field that is growing. I think we talked about this in one of the earlier sessions, that students were beating down the door for this kind of work. Can you talk a little bit about the student enthusiasm? Was it also in the air, when it comes to urban economics? Was this something that was really attractive to young scholars starting out?

06-00:24:04
Tolley: Well, I think people who came into economics — at Chicago, at least, and probably other places — they wanted to do something. In that sense, it was more than just an intellectual interest. They wanted to do something. I'm coming to the thought, see, I was the son of a civil servant. Actually, as we may have said, I thought I would come back to Washington and have my career there. I was aware of the tremendous difference that skilled civil servants can make to how the whole thing works. So I thought, and I still think, that it's a very worthy thing to do, to train people to go and improve the way that our government works.

Burnett: Can we talk a little bit about what things were like in the absence of the skill that you're imparting? I think in some of the writings, in almost every subject that we're going to be talking about in the next several sessions, somebody — either you or one of your collaborators — writes something like, "this issue has been treated heretofore in an essentially qualitative manner. And it's political and it's just stakeholders battling it out. What you need is a positive policy approach." I take that to mean positive in the sense of positivism, in the sense of objective analysis.

06-00:26:03
Tolley: Scientific, right.

Burnett: Scientific analysis. I'm thinking of Henry Simons' *Positive Program for Laissez Faire* [*A Positive Program for Laissez Faire: Some Proposals for a Liberal Economic Policy*]. It just popped into my head when I was reading that. So can you talk about what it was like when you were encountering in

the Office of Tax Policy and your time in government, also from what you learned from your father's travails? What was it like to look at a set of policy questions, read about it in the newspaper, and see how it was being approached and discussed? Did it strike you in that way? Did you read in the paper, "Here's a new policy we're going to implement," and it just struck you as, that doesn't work?

06-00:27:00
Tolley: Well, maybe so. It's hard to verbalize these things.

Burnett: Yeah. Hard to pinpoint the precise influence that sparked.

06-00:27:06
Tolley: Yes, it is.

Burnett: But it was in the air among economists. You had a cohort of people who were thinking in this way, I guess going back to [T.W.] Schultz, even earlier? Your father thought in fairly quantitative terms, I suppose.

06-00:27:29
Tolley: Well, he was a math major—.

Burnett: Right. So in a sense, this is an old problem for you, that you've been witnessing your life over. You've been looking at how policy decisions are not always or often determined by a kind of dispassionate analysis.

06-00:27:57
Tolley: I think, also, economics was developing. Do you know the name of A.C. Pigou [Arthur Cecil]?

Burnett: Yes.

06-00:28:06
Tolley: He was a contemporary of Alfred Marshall.

Burnett: Yes, welfare economist.

06-00:28:10
Tolley: Yes. He introduced the idea of externalities. It was actually about, without getting too far off, women were having their clothes dirtied by the coal smoke from the factories, and that was the divergence. The producers of the textiles didn't have to bear those costs. There was a theoretical literature developing on that, but it never — there was so much theory. I think we've said this before. Ted Schultz once asked me a question about this, "Is it theory or fact?" I said, "It's both. You've got to have the fact with the theory." I think that's why I got my job at Chicago.

Burnett: That's great. That's really great. Well, you're not in the weeds, because I think this is really important. Richard Zerbe and a number of others put together, at

the Benefit-Cost Analysis Center, a report in 2010, called *Toward Principles and Standards in the Use of Benefit-Cost Analysis.* It has a brief history of benefit-cost analysis. It talks about Kaldor, Nicholas Kaldor, and various efforts to look at externalities and non-market goods or non-market aspects; Harold Hotelling's 1949 work on the travel-cost method; [Sherwin] Rosen's 1974 work on hedonic valuation; [Robert Cameron] Mitchell and [Richard T.] Carson's 1989 work on contingent valuation. We're going to get into all of this stuff later in these sessions. But the point is that the profession is wrestling with some of this stuff.

Then there's another strain of our history. And that is the [U.S.] Army's work on benefit-cost analysis and its research; but then starts to get into statecraft, through people like Robert McNamara, for example, who brings benefit-cost analysis to the federal government, to some degree, at least to the Department of Defense. But the point of this is, there are multiple disciplines and sites of research work that are supplying a theoretical foundation for a much needed project, which is to analyze, in a constructive, sophisticated manner, choices between policy alternatives. That's basically what we're talking about this whole thing. So urban economics and environmental economics, these are moves towards benefit-cost analysis. Is that fair to say?

06-00:31:48
Tolley: Well, of course, urban economics and environmental economics are disciplines. There're [rooted in] certain fundamental ideas. I did want to go back. Did we talk about the "Green Book?"

Burnett: Yes, we did. Yeah.

06-00:32:04
Tolley: Yeah. So I would say that that's what brought benefit-cost analysis into government; Bob McNamara was a little late to the game.

Burnett: Yeah? Okay.

06-00:32:15
Tolley: So that part is there. Actually, that came out of agriculture. It's the Soil Conservation Service. As I say, some clerk at midnight, over on the Hill, wrote in this thing, "The benefits shall exceed the costs to whomsoever they occur." That got this group of economists to come together and write this "Green Book." That's really the start of the whole thing. I also want to point out — Dick Zerbe was my postdoc. I really credit him. It's wonderful how we went to the MacArthur Foundation, who don't like economists, but somehow he got them to fund it, and the thing is remarkably successful now.

Burnett: What did they fund, the MacArthur Foundation?

06-00:33:13
Tolley: The Benefit-Cost Society [Society for Benefit-Cost Analysis]. They put the seed money.

Burnett: Okay. Great.

06-00:33:17
Tolley: Now the society is raising money on its own.

Burnett: Right. It has something like 8,000 members or something.

06-00:33:24
Tolley: Something, yeah, it's really—.

Burnett: It is impressive. So while we're on that track, so one of the interesting things about this is that you're using a kind of descriptive analysis and moving into normative territory very carefully, because in benefit-cost analysis, the kind of hallmark of it as an approach is to refrain from making judgments about things like distribution and ethical questions, right? That goes all the way back to [Nicolas] Kaldor, who's saying, "Pareto optimality is what you should strive for, but I'm not going to tell you what you ought to do about something." Pareto optimality is hard to argue against. If everybody is better off and nobody's worse off, who's to gainsay it? But beyond that, everything gets a little thorny. So one of the things that's pointed out in this history of the Society for Benefit-Cost Analysis and the approach of benefit-cost analysis is this movement toward thinking about ethical questions, policy questions, and incorporating that into benefit-cost analysis, as if they were externalities.

Which brings me to my next subject. This is part of some of the work that you're doing in urban economics in the 1970s. We talked about this in session five, I believe, *Urban Growth Policy in a Market Economy*. You collaborate with a ton of people. I think there are a couple of articles that you wrote by yourself, but then you co-write a whole bunch with a number of other scholars. The approach is positive policy analysis. You're weighing the relative importance of effects. But you argue that that can become obscured by rhetoric. So you're moving into territory that's contested, it's political, and you're looking for a way to incorporate some of these questions, and you use the phrase "fiscal externalities." So I'm wondering if you could talk a little bit about fiscal externalities. Does the work on environmental economics and the externalities of air pollution, does that lead you to consider other things that are usually considered to be social policy considerations, as externalities that can be incorporated into policy?

06-00:36:45
Tolley: Well, I think fiscal externalities; they are objective externalities. So in that sense, I think for better or worse, the attempt here has been to avoid normative economics, and I believe really still is; that you get an awful lot of insight out of figuring out what the objective effects are. By the time you do that, you're

on your way, often, to a solution. So often, you don't need the normative side. [interview interruption]

Burnett: In a number of other cases, when I have talked to economists and when I read the work of economists, even of someone like Milton Friedman, for example, I think there's this one passage where he writes, "You can talk about something one ought to do, but if you could talk about whether it would have the outcome that they predicted, then you could have an interesting conversation." Because it's all fine to have an objective and say, this is the moral impetus behind *X* imperative, if you get the opposite results of what you intend to do, that's instructive. Is that a Chicago approach, or is that more broadly economics at this time?

06-00:38:35
Tolley: Well, you're describing the Milton Friedman approach.

Burnett: That is true. But it also relates to a lot of this kind of work, of Barton Smith and Philip Graves and you. So you're looking at fiscal externalities of the effects of property taxation for education. So universal public education as a policy objective, for example; minimum wages to support people on the lower end of the economic spectrum; and welfare payments, for the same objective. So these are redistributive policy projects. You analyze them chapter by chapter. So I'm wondering if you could reflect a bit on your approach and again, where that impetus came from. Was this something that emerged through conversations? Was it something that was in the air at the time? That you're reading the newspaper, reading political dialogs in the press, and coming to some economic reckoning with the policy landscape as it was unfolding in the 1970s?

06-00:40:09
Tolley: I think they were phenomena that were objective phenomena, but were being neglected. They were just waiting there, and I think the time was ripe to do something about that.

Burnett: Well, this is ten years in. Let's say you started on this, because this is an edited volume, so I imagine you started in 1975, if it came out in 1979.

06-00:40:34
Tolley: At least.

Burnett: Right. So these are multi-year projects. I understand that well. So let's say it started in '75. That's ten years into the Great Society and two years after the oil crisis and several years into the recognition that you could have high unemployment *and* high inflation. So the wheels had come off the Keynesian rationale for heavy state intervention in the market. At least that's how those historians have interpreted it; I don't know if it felt like that at the time, from your perspective, or even from Milton Friedman's. But that seemed to be in the air in 1975, '76, and here this project gets going.

06-00:41:31
Tolley: So I can only think of examples. When I was in the Department of Agriculture, the secretary — remember the Watts riots?

Burnett: Oh, yeah. 1965.

06-00:41:43
Tolley: Yeah. So they occurred, actually, I guess when I was in Washington. Anyhow, the secretary of agriculture said, "This shows that the American people don't want to live in cities; they want to live in rural areas." That stuck in my mind, and so I wrote, one of the key articles in the book, called "The Welfare Economics of City Bigness." It was wrestling with that problem.

Burnett: That was the spark for you?

06-00:42:17
Tolley: Yes, it was.

Burnett: Wow.

06-00:42:23
Tolley: Yeah. Yes, it was.

Burnett: There is something decaying and boiling over in the cities across America, and it's the congestion and the pollution and all of that that contributes. But what about race? Because I think a lot of people, when they think of Watts, they're called race riots, right?

06-00:42:50
Tolley: Yes, that's right.

Burnett: So the sense that there was kind of a Jim Crow operation going on in the cities, the redlining of housing districts. But that's something you dive into. You look very closely at housing markets and choices. There's that work — we discussed this last time — that Barton Smith did on kind of these von Thünen zones, with respect to black and white neighborhoods: the degree to which you're willing to live next to the boundary, and prices get up the further away you go. So there are all of these questions that are being dealt with directly. Race is a factor in the research that you and other scholars are doing in that edited volume and in subsequent ones, as well.

06-00:43:57
Tolley: Of course, when you get into urban [issues] very deeply, you get right into housing, and you've got to deal with the economics of it. Martin Bailey and Richard Muth, they were here. I think one of them was at the Booth school [University of Chicago Graduate School of Business] and one was in the economics department. They'd been writing about Hyde Park. They said, "Blacks want to live near whites, but whites don't want to live near blacks." They started this whole thing. Martin, and in my research projects, we took

that up in a big way. But I have to give them full credit for having originated that. Once you do that, then you can get a model that explains this behavior. I don't know whether anyone approves of it or not, but it's the objective explanation of what's going on, and it has a lot of predictive power. That's what Martin showed.

Burnett: I don't know if you were close enough to their research, if you read about it or if you were having conversations about it while they were doing it. Did you find that they had a similar approach to that of the ag economists, that they would go out and see? Did they talk to people? Did they ask, "hey, black people, do you like living next to white people?" I'm being facetious, but I will say that there is a criticism out there of Chicago economics as a kind of colonizing force in the social sciences. So I think George Stigler was known to have said that you could wrestle with a problem in sociology for an afternoon, and then come up with an economic analysis for it. He's famous for making those kinds of incendiary comments. I've talked to many social scientists in anthropology, in sociology and so on, and one of the criticisms of a Chicago approach is that they don't do what the ag economists do, right? They dabble in something that sociologists have wrestled for decades, or they dabble in something that anthropologists have wrestled with for decades, and then they come up with an economic analysis that either disregards some of the nuances or ignores– Here we have a very complex race problem that is deeply historical. It's economic, as well, but the drivers for why people do things are psychological, they're historical, they're irrational and so forth. Given a criticism such as that, what do you say about the work of the Bailey-Muth model? Do you feel like in a sense, it doesn't matter what the more profound sociological or historical problems are; the data are the data and the behavior is the behavior; and if the model predicts the behavior, then there must be something to it?

06-00:47:43
Tolley: Well, I think what you just said is true. There is something to it. What you're saying brings together a lot of things. I would say first of all, I think the economists have missed the boat on what the real racial problem is. It's cultural disadvantages and so forth, and they're not good at analyzing that. They still aren't good at that. However, let's go back. I think Dick Muth, I inherited some students from him. He left just when I was coming back, and I inherited—

Burnett: When was that, when you were coming back?

06-00:48:26
Tolley: Well, was that '66 or '67?

Burnett: Okay, when you were coming back from the Office of Tax Policy Analysis.

06-00:48:31
Tolley: No, when I was coming back — I was at North Carolina State, and then I went to the USDA.

Burnett: Right, I was off a decade there.

06-00:48:40
Tolley: Yes. I went to the USDA. Then while I was there, Al Harberger came to Washington.

Burnett: He poached you, didn't he [laughter]?

06-00:48:50
Tolley: Yes. He said, "Ted Schultz wants you back at Chicago." So in any case, I think Dick was just going to Emory, I don't know. Anyhow, Dick is a brilliant theoretician, and his book—. Is it called *Cities and Housing*? I forget. [*Cities and Housing: The Spatial Pattern of urban Residential Land Use*. Chicago University Press, 1969]. Anyhow, it's a very important theoretical book, and he zipped the Harberger triangles around wonderfully. But it's true, he didn't do any important empirical work. Actually, Dick Muth, I think his thesis was with Al Harberger and—.

Burnett: Yeah, that's right, became part of *Demand for Durable Goods.*

06-00:49:39
Tolley: Yeah, that's right, and his thesis was this book. But he was not an empiricist. Then there was Martin Bailey, a brilliant guy. He was not primarily an urban economist at all. Did he work in the Treasury? He was a brilliant guy. He's probably one of these underappreciated people. But they were coming in from that side of the thing. Then of course, there was Gary's work on discrimination, which was very fundamental, of course. I would condemn the economics profession; they still haven't got to the heart of this problem yet.

Burnett: Yeah, I think that— and I might be misreading—but Gary Becker's *Economics of Discrimination* [1957] basically says that it's economically irrational for a firm to discriminate because it creates this pool of discriminated-against and talented people who could then be swept up at a discount.

06-00:50:58
Tolley: Yes, right.

Burnett: So there's this tremendous price incentive not to discriminate. And yet, there's massive discrimination.

06-00:51:07
Tolley: Right.

Burnett: So I think systemic racism had yet to be considered by a number of professions, not just economics. But I think culturally, we were not thinking in a sophisticated fashion about the legacy of institutional racism and of the totality of systems of racial discrimination. But that is also history, that is, that a social science occurs in a context, and scientists, as objective as they may aspire to be, come from a context, are situated in a context. They see things in a certain way because of where they've come from, and maybe what color their skin is, too. That might be a feature. Of course, you don't want to be insulting to a brilliant thinker, because we want to believe, all of us want to believe, that we can see with clarity. Yet there can be these blinkers, I suppose. Do you ever feel that way? Do you feel that there are things that you, in hindsight, missed because of how you saw things?

06-00:52:34
Tolley: Well, I don't know. I became an economist, not a sociologist or something.

Burnett: So certainly, your training shapes what you see. Absolutely. I think there's no question. And there's an aptitude feature. You were drawn to economics. You were attracted by that powerful way of looking at things. And without question, it's powerful. There are not a bunch of anthropologists advising at the World Bank or the International Monetary Fund. It's very, very true that economics is, I would say, *the* most powerful social science, in terms of its reach into the world outside of the academy, in terms of its appeal for the tools of government, right? So people who make decisions about influencing people's lives, economists have their ear, I think it's fair to say.

06-00:53:38
Tolley: So we probably talked about this before, but I grew up during the Great Depression, with Roosevelt and all that. So I just naively assumed my thing was to save the world from the Great Depression again. And I think a lot of people came into economics at that point. Was I misled? I don't know.

Burnett: Every single person I have interviewed from your generation says exactly the same thing. And it makes sense. How could you not be influenced by that degree of economic dysfunction, to see that things were not working well? And that you were moved to change it as a young person, especially. As a young person, is there a bias to youthful academic pursuits? The world is entirely given. The world is plastic; it can be moved, it can be changed. There's a hope that one can have an influence and change the structure of the present and the future.

06-00:54:55
Tolley: I don't know why I'm saying this now, but when we moved back to Washington, Andrew Mellis wanted my father to come back and run the 3-A [Agricultural Adjustment Administration]. I was eight or nine years old. I was sitting on a park bench in front of the White House, and a little black kid, probably a little younger than I, he came along and was picking garbage out of the trash.

Burnett: Yeah. No, you did tell that story. But it's significant that you tell it again. It's a formative story for you.

06-00:55:33
Tolley: Right.

Burnett: You saw two things. One, you saw human suffering. But the second thing, you saw racialized human suffering, so that's another factor to it, as well.

06-00:55:47
Tolley: I think I am more willing to be critical of economists than most people are, because I think, well, then I had a liberal arts education, so I snobbishly say I have a broader viewpoint than most economists.

Burnett: Do you think that, I want to say, humility, is a kind of asset as a social scientist, or as a scientist in general? With epistemological humility, you need to be worried about the limits of your knowledge, worried that your approach is missing something, that there is a kind of doubt that is enormously productive in the work. So to form this as a question, the portrait of Chicago economics in its heyday, maybe the culture of the workshops, some feature of it might be considered arrogance, or confidence at the very least. There's a lot of young men in a room duking it out and, "I'm right and you're wrong," some level of gentlemanly combat. But from a distance, it could look like arrogance, right? Especially if you have personalities like George Stigler, who had this kind of outsized personality, shall we say.

But I hear different stories, from you, from Lester Telser, from George Shultz, from Arnold Harberger. These are all very confident people, but there is a concern about limits, so not just criticizing another policy or another economic theory, but a concern that one might always be wrong. We need to be careful here. Is it built into the argumentation? Is there a kind of structure to economic argumentation? Leaving Chicago aside, is there a structure to economic argumentation or the rhetoric of economics that argues by, through caution and care, by limiting potential criticism, anticipating it, and producing careful counter-arguments before the fact? I see that richly when I read an economics article as literature, as a rhetorical approach. That's what strikes me. Is that part of it? Or did you feel that your liberal arts education, not your narrow economics training, is what gave you a kind of epistemological humility?

06-00:59:00
Tolley: I think it was the liberal arts. The Chicago economics give you something unique, but it's not what you're speaking of. It's not humility [chuckles].

Burnett: Well, it's interesting that you say this. We need as many plugs for the liberal arts as possible because as I understand, in the last ten years, enrolments are down across the humanities by about 40 to 50 percent.

06-00:59:31
Tolley: Oh, really? That's really something.

Burnett: Especially in the last five to seven years. So something's going on. But it's refreshing to hear an accomplished social scientist, policy adviser, architect of some of the key facets of our modern world claiming that the liberal arts were an important foundation to his approach to thinking about things.

06-01:00:03
Tolley: Well, I hope so. I'm glad.

Burnett: So that's the 1979 volume, *Urban Growth Policy in a Market Economy*. Interestingly, at the tail end of that, there is as close as I think we might come to a kind of policy prescription, because I know you don't like to do that. But in the conclusion, you argue that there should be a more explicit and defensible population distribution policy. But that more explicit and defensible policy would come about by the elimination of existing distortions of policy. That was the gist that I got. The conclusion, especially based on the three previous chapters—eight, nine, and ten, I think—that welfare payments, minimum wage policies, and taxation for these diffuse benefits, such as universal public education, can cause excessive concentration in cities, is that right? Is that the position? I may have misinterpreted. What do you think?

06-01:01:40
Tolley: If that's there, I don't know, this is a complicated subject. Later, when I was working more on the environment, the thing that comes out for me almost immediately is that we don't pay enough attention to locational incentives when we locate polluting sources. If we did that, we would have a very different distribution of population. But it's politically impossible. Politicians will not tolerate your saying, well, you should move people out of your area. So unfortunately, that's about the end of that.

Burnett: So there's a path-dependence to the establishment of large cities. Large cities acquire their own blood supply, shall we say, and they metastasize into these large kind of super-organisms that are initially located near easy modes of transportation, such as river systems, and easy access to resources to produce things.

06-01:02:55
Tolley: Right.

Burnett: Then they kind of acquire their own momentum. One of the things that you do is the following. To take minimum-wage policy, for example, one of the things that's ignored, and this is very topical today, because there is now a real campaign for federal minimum wage of fifteen dollars an hour. There are municipalities that are raising their minimum wage to fifteen dollars an hour. You do a policy analysis where you look at no minimum wage; a bifurcated minimum wage, where there's a minimum wage for the North and a minimum

wage for the more impoverished South; and then a blanket minimum wage for the whole country. You note that if you're going to have a minimum wage policy, it's better to have it adjusted for the real wage, because the cost of living is higher. If you have a universal minimum wage, the area that has the lower cost of living is going to have a tremendous advantage, and population will relocate and re-equilibrate in a mal-allocative way. Is that fair to say?

06-01:04:24
Tolley: Yes.

Burnett: Okay. So I think that's an example of the kind of research that you've done, where there's a goal, a policy goal, that comes from a moral place that looks at impoverishment, say, and says, well, a solution to poverty is to give people some money, right? Or to give them enough so that they can handle the costs that they face. You take that and you say, well, what if that happened? What would people do? How would they behave? What would happen to prices? And you analyze that and you model that, and you come to conclusions that would have policy utility. So for example, today, Tolley's advice on the federal minimum wage would be, it's a bad idea, presumably.

06-01:05:18
Tolley: Right.

Burnett: But for Seattle to raise its minimum wage, it might not be so bad. It's going to have allocative effects and it's going to have population effects, but it wouldn't be nearly so bad, because that higher minimum wage in that city, with a very high cost of living, would, in a sense, be reflective of the real costs of living in that place, and would not necessarily yield the kind of misdistribution or mal-allocations of people and resources. Is that a fair thing to say?

06-01:05:59
Tolley: Oh, yeah.

Burnett: So this is what's being explored in this, and you're just stepping back from the brink of a commitment to a particular policy and saying, that is for the politicians to decide. As a professional economist with a commitment to helping policy makers, your job is to analyze given proposed policies and examine them in economic terms to determine likely outcomes, so that they can make the best-informed decisions. Does that encapsulate your professional identity?

06-01:06:50
Tolley: Yeah, I think it does.

Burnett: So there's one more in this period, the work with Douglas B. Diamond, Jr., *Economics of Urban Amenities*, in 1982. It's about the amenity concept, which we've already talked about in previous sessions. You write about how the amenity concept can promote the integration of regional and urban economics.

So you're moving away from the rudimentary—and powerful, but rudimentary—William Alonso model of cost-plus-travel: that rent plus travel, let's say, determines where you sit in relation to distance from the center of an urban area. You add in this amenity concept, which can be a whole bunch of different things, and it's a very fluid and fungible concept, it seems. It really struck me reading this, that this is so deeply connected to our world today. In fact, I was almost laughing to myself when I was reading some of the things you were writing in the 1970s. I think you wrote at some point, a high-cost city may have costs 25 percent in excess of a low-cost city. And I was thinking of the rent in the Bay Area being three times the rent in even a decently-performing city like Minneapolis; but a city that's not doing so well, like Baltimore or Toledo, it would be four or five times.

06-01:08:56

Tolley: Oh, yeah.

Burnett: These disequilibria, I suppose, between high-cost urban environments and these low-cost rural or decaying urban environments, it's so striking in 2018. I wanted to ask you about that. The *Economics of Urban Amenities* does deal with the concept of gentrification, and it looks at how the process happens, how it moves step by step. That an improvement is made when a high-income individual moves in and purchases an area; they have an interest in increasing the value of the things that are associated, nearby. And there are these knock-on effects, as people who move into areas bid up the prices of things with their purchasing power. I looked at how this also influences social policy. The broken windows hypothesis, right? If you just clean the graffiti off these areas and make these small improvements, it has these other effects. A superficial improvement like that can increase neighborhood values, can influence economic behavior, it can move people around from place to place. So I looked at gentrification as a term. I put it into Google Ngram [Viewer], which sort of measures the usage of a word across many, many publications over time. Its first usage is around 1970, but it really takes off in the three years before this book comes out. So it's really hot, and there's this almost really straight-up curve in the usage of this term. So I wanted to ask you now, from the point of 2018, are we better now at thinking about the problem of gentrification? From your initial wrestling with it in this book in the early 1980s, are we smarter about gentrification now?

06-01:11:26

Tolley: Are we smarter? We know a lot more about it. There's been a tremendous amount of work on amenities, both by economists and geographers and people on the fringes. So let's see. I want to go back through the thinking. There was the Alonso article, and actually the Muth work. Amenities don't figure in that at all [in that work].

Burnett: Yeah. It's early sixties, that stuff.

06-01:12:00
Tolley: Yes. So my insight about that was that it's wrong, because people think about all these other things, care about all these other things. So we took this survey and the article is in '68, and that was in the *Review of Economic Statistics*. [R.N.S. Harris, G.S. Tolley, C. Harrell, "The Residence Site Choice," *Review of Economic Statistics*, Vol. 50, No. 2, May 1968]. And it challenged that and said they're amenities. The whole thing then—that was in the late sixties—the whole thing, the book and all that, the interest in amenities came from that. I'm still working with Terry Clark. He's a sociologist and he works on amenities in a huge way. We've done a lot of work together. We're doing some more work together, even now. Then there's Ed Glaeser. I was just—.

Burnett: Sorry, what was the name?

06-01:13:20
Tolley: Ed Glaeser.

Burnett: Ed Glaeser.

06-01:13:04
Tolley: He's Mr. Urban Economics. He was here. I tried to get him to stay, but he had the call of the East Coast. So anyhow, the proceedings of the recent economics meetings in Philadelphia, the annual meetings, one of the lead articles was about gentrification and the statistical methods for identifying gentrification. People just think an awful lot more about it now. Do we know more about it? Are our policies more sensible? I'm really not sure.

Burnett: I think this is very acute, this problem, in Oakland, for example, where I live. There are calls for rent control. I know that George Stigler and Milton Friedman — Didn't they write that article, "Roofs or Ceilings," about something like housing control, or quotas for housing, basically? And saying, do you want price ceilings, or do you want a roof over your head? You've got to make a choice. There's been this push for the longest time — "you're going to restrict the supply of housing" — but the other sort of Tolley analysis, there's so many other factors going into the limitation on the construction of housing. The construction of affordable housing is a real challenge in a place like the Bay Area, which is a real example of what you were talking about in the 1970s. It's hard to have low-cost housing when housing costs so much. The basic cost of the land—

06-01:14:59
Tolley: Oh, yeah.

Burnett: — is enormously expensive. We were talking about affordable housing. It's not affordable to working people. There's just no way, unless you subsidize it in a really, really extraordinary fashion. So this is a really acute problem that people are wrestling with. And the solutions, we don't see a lot of nuance. It's just rent control or build a bunch of housing for the homeless. There isn't a lot

of thinking, I guess, about the consequences of this or that policy. It just seems to be driven a lot by the extraordinary need, which is undeniable. It almost seems like that a valuable approach to thinking about urban growth, it's almost superseded by the political tension, and the policy environment or arena is governed by stakeholders of various kinds—the city government and the realtors and the realtors' associations and all of that, and the community action groups and so forth. So at any rate, it's a real challenge. But I wanted to underscore how alive this research that you began forty, forty-five years ago is today. These questions are ever-present. And our society has become so much more regional, it seems. In your day—we were talking about the 1930s and forties, when you were growing up and thinking about what you wanted to be—there was the South, which was an extreme regional entity, and then there were these different sections that had different economic characteristics and different manufacturing and all of that. Now we have this massive divide between Rust Belt hinterlands and the coastal, vibrant megalopoli, right?

06-01:17:39
Tolley: Yes.

Burnett: From L.A., and Chicago here. It's a handful of giant cities, and then maybe twenty other successful cities, and then a whole bunch of economic hurt out there. This analysis seems really important for the work that we're doing now, in trying to figure out how we can handle this kind of economic difference between these regions and within the regions.

06-01:18:11
Tolley: Are you interviewing Bob Lucas at all?

Burnett: I want to. We'll see. He's on our list, yeah.

06-01:18:26
Tolley: Actually, Nancy L. Stokey, this idea of human capital in cities, and you have these so-called agglomeration effects, where people come together and exchange ideas. They're pushing that idea. And it's just, of course, a very important idea. But that's an undercurrent, also, in what you're talking about here.

Burnett: While you mentioned Bob Lucas, Arnold Harberger talked about the open-economy macro group — Bob Mundell, Bob Lucas and Harry Johnson, and the influence they had on the younger and Chilean economists who were thinking through the consequences. And this is macro policy, so it's a bit farther afield from what you're looking at inside of a nation-state. But it occurred to me that they're doing something analogous. They're thinking about, if you have an open economy, what does that do to trade, right? If you've got now a world market. As an ag economist, you're thinking about that all the time, anyway, right?

06-01:19:56
Tolley: Right.

Burnett: I think that's built into your DNA. You're just thinking about world prices for the major commodities and that's just a given. So they're wrestling with that. It made me think about another influence from agriculture in your thinking. Is there a kind of open-economy model operating within a nation-state? Because you talk about tradable goods in a city, and then the services that are not tradable, that are not subject to a transportation cost; they have to be delivered on site. So there's a splitting up of the markets into tradable versus non-tradable, which is open-economy macro. But it also, I think, applies to your thinking. Is there any cross-pollination or influence, or is there just a common ancestor in what's going on?

06-01:20:44
Tolley: It's probably a common ancestor. It's certainly what you're saying. Tradable and non-tradable goods is at the heart. I don't know, I certainly was at the center of the development of— see, we didn't really go into this. Before a certain point, regional economics was not true economics at all; it was just local-multipliers analysis, and it didn't get at the fact that people would migrate between regions. So certainly, at the center of what I've taught in urban economics is what you're describing. It's a bunch of nation-states, if you will, where you can't restrict trade, and people are free to move, goods are free to move. That's the essence of regional economics, in my view. And I think it's probably accepted.

Burnett: I don't know if it was prophetic at the time, but what you were analyzing at the time, that phenomenon has amplified today. I think what you're describing in 1968 and what you're describing in the late 1970s is more true today than it was then, it seems. I don't know, maybe that's an exaggeration, but that's what it looks like to me when I read this work. It doesn't seem stuck with a set of policy prescriptions that only applied to the seventies. There's some examples you could think of that would be applicable. But this seems to be much more true today, than in the past.

06-01:22:37
Tolley: Well, I certainly agree with that, yes.

Burnett: No, absolutely. We talked about this in a couple of session, the "Residence Site Choice." We won't mention that again, but that's an important paper that's also—.

06-01:22:52
Tolley: Well, that's the '68 article.

Burnett: So that is the '68 article that's in the *Review of Economic Statistics*?

06-01:22:58
Tolley: Yes.

Burnett: Okay. So it's included in this volume.

06-01:23:02
Tolley: I think it is.

Burnett: It is. Yeah, no, it definitely is. So that is in the *Economics of Urban Amenities*. Does that mean that that was, for your purposes or from your perspective, the ur-article? Was the origin article for you—?

06-01:23:18
Tolley: Yes, it was.

Burnett: Okay. So it's included in this volume to say, "This is the lineage."

06-01:23:23
Tolley: Yes.

Burnett: For George Tolley, at any rate, this is where all of this thinking comes from.

06-01:23:27
Tolley: Yes, yes.

Burnett: Okay. So that's important to know. Let's switch gears here. There's another context to the 1980s. There's a lot of change in the 1980s. There's a lot of regulatory reform. Another side thing that is noted by the Society for Benefit-Cost Analysis, and I think it's very true, is that there's this — and you mention agriculture being an important source of this kind of approach, and the Army and the Department of Defense – it's pursued at the executive level. Nixon writes this into regulatory evaluation. LBJ [Lyndon Baines Johnson] and [Richard M.] Nixon made benefit-cost analysis a part of regulatory evaluation. But in 1981, Ronald Reagan required that regulatory impact analyses be conducted for all major government initiatives. In 1996, Bill Clinton makes benefit-cost analysis best practices for the Office of Management and Budget. And I'm surprised that it wasn't already by that point.

06-01:25:02
Tolley: Right.

Burnett: But let's say it was made official. In 2002, George W. Bush makes regulatory policy advisors who use benefit-cost analysis in place of the vice president in making regulatory decisions. So, not that the vice president makes a ton of regulatory decisions anyway, but this is the lineage that Richard Zerbe and his other scholars make in *Toward Principles and Standards in the Use of Benefit-cost Analysis*. So that's one thing. The other thing that I wanted to ask about is that what's changing in the regulatory landscape is around innovation. So there are laws passed. You can patent living organisms; there's those regulations in 1980 [*Diamond v. Chakrabarty*]. But there's a series of changes in the laws that increase — I think it triples — the number of patent applications and awards during this period. So there's a tremendous amount of

activity around intellectual property in the 1980s, and great deal of ink is being spilled. So I am guessing that that is the context for this next work that I'd like to talk to you about, and that is with James Hodge and James Oehmke.

06-01:26:42
Tolley: Oehmke, yeah, Jim Oehmke.

Burnett: Oehmke, *The Economics of R&D Policy*. So there's a recession in the early eighties; there's the biotech revolution and all of the litigation that goes on with that; fear around the unfair competition from Japan; stagnant spending on private research and development in the United States in the 1970s, when the rest of the world is spending more — which is also reminiscent of 2018. This is something that's also of concern today. So there's a lot of really interesting work in this book about innovation. Can you talk about the analysis of innovation and the way that you and your colleagues approached the question around the best policy to foster innovation and competition?

06-01:27:57
Tolley: Right. Okay. Was that put out by the Council on Foreign Relations of Chicago? Probably.

Burnett: No, that's an earlier one. That's from '79.

06-01:28:12
Tolley: I see.

Burnett: Yes, I also have that one. Let me see.

06-01:28:17
Tolley: Okay. Well, in any case, there're two strands of thinking here. One, I was working very closely with Argonne [National Laboratory].

Burnett: Right.

06-01:28:32
Tolley: A lot of this work on the environment, there was someone who was with the NSF. Larry [W.] Tombaugh was his name. He ended up as the dean of forestry at Michigan or something. He got Argonne and the University of Chicago together, because he wanted to foster this interdisciplinary research, which I heartily believe in. So there was the NSF. There was a series on the environment. It was really centered around the city of Chicago. We modeled the city of Chicago. Then with Argonne we modeled the air pollution effects of the various policies. So then Argonne scientists were trying to develop useful inventions. That's probably what that book is, and a lot of the work was about that. It was like a benefit-cost analysis of innovations. You take a proposed invention; what are going to be the economic effects and what are the probabilities that it's going to pay off? So we did a lot of work on that.

06-01:30:12
Tolley: There's another strand that doesn't show up too much. If I have a regret, it might be that, although other people are doing it. It goes back to growth theory, and the original idea was that you save to grow. Then the [Robert M.] Solow work came out and it said, well, you can have technological change for growth. So I took that idea and went with it. I said capital is the dependent variable. The real thing that determines growth is knowledge and innovation, and I taught that in my ag classes for quite a while. But I wish I had pursued that idea further. So anyhow, how did we get into that?

Burnett: Well, I was going to ask you about Vernon Ruttan. Or [changes pronunciation] Ruttan.

06-01:31:31
Tolley: Ruttan, yeah.

Burnett: Ruttan. He's at Minnesota. But he was a student of Theodore Schultz's, I think. He did a lot of work on growth and innovation.

06-01:31:48
Tolley: Induced innovation.

Burnett: Induced innovation. It was with [Yujiro] Hayami, in 1986.

06-01:31:52
Tolley: Yeah, probably.

Burnett: Yeah. I know you've cited him, so I know he is a kind of influence. What was your relationship? Did you know him? Or did you just know his work?

06-01:32:05
Tolley: I knew Vern. He's dead now, as you may know. I knew him very well. In fact, I might have been the technical chairman of his committee. But it was Ted's work. Vern did it all. He was a wonderful guy.

Burnett: Yeah. I would love to know if that's true. So that would be helpful to figure out, in my plotting of all of this, because as I'm reading your work on innovation, I just think of Dr. Ruttan's work. I think one of the things that is coming up, Brian Wright wrote a really interesting paper as part of this, as well.

06-01:33:07
Tolley: Brian Wright, he was at Berkeley. Is he still there?

Burnett: I don't know. I'm not entirely certain. But his paper was on the role of the state in maintaining a competitive environment. As you know, Vernon Ruttan, I think as a student of Theodore Schultz, is thinking about the role of the state in the fostering of innovation and competition. And it seems to be a strain of that coming out in Brian Wright's paper. But when you take all of this

together, a lot of it has to do with the basic assumptions, and the basic assumptions were kind of unstudied, that the life of a patent, which is kind of just sort of worked out among various countries, seventeen years in the United States, fourteen in a lot of others. But basically, that there's this sweet spot of granting a kind of monopoly on profits for an inventor or someone who owns a patent, that is temporary; and then afterwards, it's made public. So it allows a return on the investment and research, but then distributes the knowledge, so that it can be improved upon. It's considered to be elegant to have a uniform patent life of, say, seventeen years, because it cuts down on administrative costs and it has this assumed benefit. And this careful research shows that, well, it depends. The basic lesson of this book is that the effects of different patent regimes are more complicated than we thought, and there's a gap between the risk and investment in research and development, and the social benefit is larger than we previously thought. So there's a huge innovation literature that results from that kind of period of consideration. [phone rings] The robocalls are in full force.

Burnett: I think the other book that you're talking about was called *International Science and Technology: The Policy Gap*. And thank you for reminding me, by the way. And that was the Chicago Council on Foreign Relations.

06-01:36:13
Tolley: Yeah, right.

Burnett: And that is with James Hodge. That is about issues of nuclear proliferation and technology transfer, international energy policy, international cooperation, with examples such as CERN, the particle accelerator in Europe. It's treating things like the proliferation of weapons technology, weighing that against new energy, discovering new uses for energy, as a benefit-cost problem. So benefit-cost analysis is being applied to these questions around science and technology policy among nations, international standards to do with them. Does that come out of the Argonne relationship? Is that something that's an outgrowth? I think that's what you suggested; is that true?

06-01:37:21
Tolley: Well, it's a continuation of it. I don't know whether—.

Burnett: Okay. So one of the things that we're going to discuss in our next session is urban economics in other countries, which is exciting.

06-01:37:40
Tolley: Yes.

Burnett: You're doing more consulting for national organizations about technology policy and environmental economics. Is there a way in which you can lead us to this consulting for the World Bank? In your résumé in the 1970s, there's some brief consulting for the World Bank. There aren't papers or reports that are associated with that consulting. But then it's in 1982, I think, that you had

your first publication with the World Bank. Can you talk about the relationship that you have with international financial institutions, and how that got started? Had it been something you've been doing for a long time and it's just it became visible in the 1980s? How did that come about?

06-01:38:52
Tolley: Well, let's see. A very good question, going back. I think it started with the USAID. I did a lot of work in Korea mainly, but then I began to work around the world. A lot of it initially was for AID. There was a person, Fletcher Riggs, the—.

Burnett: Yeah, that's right.

06-01:39:17
Tolley: Did you know that name?

Burnett: Yeah, yeah.

06-01:39:19
Tolley: He was at TVA when I was at NC State. We worked together. He took a great interest into my work, and we worked on the Western North Carolina —. What was the name of that? Anyhow, we worked on economic development in a big way there. Then Fletcher got into international work. I guess he was stationed in Korea for USAID. So I went over there several times, working with him. That's really where that began. Then there was Vinod Thomas. He was a student here. He went to—.

Burnett: He worked on your 1973 book, didn't he? The *Trade, Agriculture and Development*. He was an assistant. He wasn't an author, but he must've been a graduate student at that time.

06-01:40:16
Tolley: He probably was. I'd have to look.

Burnett: Yeah.

06-01:40:19
Tolley: But in any case, he finally ended up at the World Bank, and then he had a stellar career. He became the highest-paid civil servant in the World Bank, and then he retired from there and he went to the Asian Development Bank. Right now, he's at University of Singapore. Vinod and I have been very close, and a lot of work developed out of that. Then there's also Bertrand Renaud.

Burnett: Renaud?

06-01:40:58
Tolley: Renaud. He's an urban economist at the [World] Bank. We were simpatico and had a lot of acquaintance. Then I went to China for him. I don't know whether I went anyplace else for him. But then I knew students from Chicago.

Actually, Bertrand was probably from Berkeley. But he was a wonderful urban economist.

Burnett: This goes back to the first AID programs, with the Chile project and Al Harberger and Ted Schultz—and that is "Pat" Patterson, Albion Patterson. Does that name ring a bell at all?

06-01:41:55
Tolley: No. What is the name?

Burnett: His real name is Albion Patterson, but his nickname, I guess, is Pat. Pat Patterson.

06-01:42:04
Tolley: Yeah, no, that doesn't.

Burnett: Okay. So he was the early contact with what was then in the 1950s, in '56, the International Cooperation Administration [which became USAID]. He approached Theodore Schultz to ask about doing a project in Latin America, and that became the Chile project.

06-01:42:24
Tolley: Right.

Burnett: So I was just wondering, since there's a Fletcher Riggs connection with TVA, we were talking off camera earlier about Ted Schultz's project on the Committee of the South, for the National Planning Association. One of the things it led me to think about was the relationship between domestic economic development on a regional basis, say in the South, and international development. So it seems like there was an impetus for David Lilienthal, for example, to have a TVA for *x* country: "We need a rural electrification program for India, and let's do it in these countries and that country." So is that how you see it? Is there a tight relationship between regional economic development in the South, for example, and the same people, the same procedures, the same processes then migrating out to other countries?

06-01:43:45
Tolley: There probably is; it's not that direct. In the first place, you've got to know the country. The whole procedure is different, and you can't—. The worst mistake you can make is to go out and try to—.

Burnett: Replicate things endlessly, yeah.

06-01:44:00
Tolley: Right, right. When I went to Korea, I found out that there was one big similarity between North Carolina and Korea. And that is that those farm boys, they thought if you just worked hard enough, you could solve the problem. What you had to do is teach them to think. And that's the same thing with the Koreans, who have now changed, too. So I think it's indirect. I think

what you're doing is taking a way of thinking about economic problems, and that is transferable, but not in any obvious way. You have to adapt it to the problem at hand.

Burnett: Do you think that it is? I think T.W. Schultz believed that it was, to some degree, universal, that he felt that you want to transform traditional agriculture. You get there by treating the people as having the same agentic power, or the same power to make rational, careful choices about things. The circumstances are always different. Their cultures are different. But he felt that it was wrong to assume that there was such a profound difference in circumstances and in cultures that what was required was a special economics called "development economics."

06-01:45:45
Tolley: No, obviously not. It's all economics.

Burnett: Right, which doesn't mean you erase cultural differences; it doesn't mean you ignore differences. In fact, that's all you do in economics is you look at how things move and change from place to place. But fundamental principles are there. So let me just then finish by asking you—

06-01:46:18
Tolley: I want to say there never was any question about that. The big thing was that protectionism was supposed to be the thing. Ted Schultz and many others put the lie to that. Of course, Ted Schultz particularly with *Transforming Traditional Agriculture*. But there never was any question that you take the fundamental tools of economics and apply them. That's still the case.

Burnett: So I want to ask you about your understanding of economic laws. So are economic laws, the basic ones — supply and demand and their relationships — are those laws, in the sense of laws of physics? Or are they laws in the German sense of regularities that—? I'm choosing four o'clock in the afternoon to become very philosophical with you.

06-01:47:40
Tolley: Right. I'm not sure my liberal education extends to Germanic—.

Burnett: I think that was what I read about once, that we get an understanding of laws as we can easily think of them as these physical properties that are almost outside of human behavior, even though we're talking about human behavior. And efforts to thwart those laws, you'll be forced to reckon with the kind of physical attributes of those laws. Another way of seeing them is, these are regularities, that they are bound, as an institutional economist might see them, these are kind of bound inside of protocols, deep traditions that are hard to move; but they're nonetheless part of human endeavor, and they have different attributes, depending on different situations. Where do you land on that when you think about these as laws?

06-01:48:42
Tolley: I don't like the terminology of "law." It's a legal concept, and that's about it.

Burnett: But not a physical concept, like the law of gravity, for example?

06-01:48:52
Tolley: Not like that, no. It would be tempting, but it's just not useful to me.

Burnett: No, no. But what you are using is, you're using mathematics as a language to describe relationships in human behavior, between agents.

06-01:49:12
Tolley: Well, that's certainly true, but you state what the assumptions are. I don't think you ever— most economists — I never say it's a law. You say, "if you assume this, you're going to get that." And that's about it.

Burnett: Right. It's a premise and a conclusion.

06-01:49:29
Tolley: That's right.

Burnett: I want to thank you for taking the time. We're already at our time for today.

06-01:49:37
Tolley: I see. Okay.

Interview 7: June 5, 2018

Burnett: This is Paul Burnett interviewing Dr. George Tolley for the Economist Life Stories project. It's June 5, 2018 and we're here in Hyde Park, Chicago. This is our seventh session. So for this session, we are into the 1980s and early nineties. We'll see how far we get, but there are two aspects of your career that I want to emphasize, both of which having to do with the questions around international development, economic development of developing countries. So the first is about the expansion of urban economics into the developing world, and your research and collaborations with others in the late eighties and early nineties. Then once we finish that, I'd like to go back to the early 1980s and follow up through the mid-nineties, to talk about the next phase of your interest in agriculture, in agriculture price policies, with respect to international development. It's a kind of work that you began thinking about in the 1960s and publishing volumes about in the early seventies. But you really develop an interest in international development from the urban and urbanization side and the agricultural development and price policy side. So those are two big areas that you were focused on. I think we started to talk about your work with institutions such as USAID to begin with and later the World Bank. You've done some consulting for the World Bank in the 1970s and you've done some projects, so I'd like to follow up then and ask you about collaborations with Vinod Thomas, including *The Economics of Urbanization and Urban Policies in Developing Countries*, which is a World Bank project. Can you talk about how that materialized and how your relationship with Vinod Thomas developed?

07-00:03:02

Tolley: Insofar as I can recall, in some sense it was just there. I think the World Bank was very interested in urbanization. The received idea was that the less-developed countries tended to be over-urbanized when they tried to promote their urbanization beyond what was really good for the development. Also it was more just a policy thought, if you will, and we were trying to bring more rigorous concepts of what determines urbanization and what some of the externalities are involved in it. So I think that was the genesis of it. At that point, there was quite a lot of interest kind of suddenly in the urbanization problem. So that's about what I recall.

Burnett: Okay. I think it's important to point out the ways in which urbanization was unfolding differently in developing countries, for historical reasons and market reasons, I suppose, as well. I think for sub-Saharan countries, thirty-five capitals in sub-Saharan Africa were increasing in population 8½ percent per year. So their populations were doubling every nine years. It's a really, really extremely rapid urbanization, and that has all kinds of problems associated with it. I think there's probably also with that, a favoring of often one, maybe two cities in a given country. So you have the rise of these megacities that we all know today are gigantic: São Paulo, Lagos in Nigeria, Mexico City. These are all megacities of 20-, 25 million people, which for me,

is just hard to comprehend. So these situations were crying out for urbanization analysis. So you began to undertake these projects with, were these graduate students? Vinod Thomas was either a postdoc or a—. He was a student of yours in the early seventies, is that right?

07-00:06:11

Tolley: That's right. By this time, I'm sure he was at the [World] Bank, and he was kind of crucial, arranging the whole thing with them, the joint work.

Burnett: Right. So he understood that this was a project that was worth pursuing, and he thought of you as a key figure in the development of urban economics and urban economic thinking. There are a couple of features to this. You write a chapter. It's called "Market Failures as Bases of Urban Policy." You look at some of the classic assumptions about growth. This seems to be a common move, both of you as a scholar and of people that you worked with at Chicago; and that is to look at shibboleths, to looks at assumptions and challenge them and poke at them and think about them differently. So one of the assumptions that you point out is that urbanization by itself is a source of growth. Just concentrating people in one place at a port or near some industrial facilities, that automatically is an engine of growth. And you challenge that. So is that part of the industrial fundamentalism that was rife in development circles in the fifties and sixties? Is that an outgrowth of that or a consequence of that?

07-00:08:06

Tolley: I think it is, yes. We were talking about this a little bit yesterday. I think that that idea of so-called agglomeration has been amended. Now people are stressing, well, when you bring people together, you have human capital complementarity, so it actually does promote growth. However, in the earlier postwar period, it was the opposite. People thought, well, the US has automobile factories, so you must have to have automobile factories to develop.

Burnett: So in part, there was a bit of a leapfrogging orientation and perhaps some influence from the Soviets, this emphasis on heavy industry. Get your steel mills up—

07-00:09:02

Tolley: Right.

Burnett: —and you'd develop this, balanced growth, when you have the different sectors. You can say, what are the key sectors? And you promote those key sectors and the synergies will almost automatically come to fruition [according to the theory].

07-00:09:23

Tolley: I was not putting it quite right. It was the non-Chicago or the East-Coast view of growth. It was accepted until folks here got involved in it. It was just

accepted that that's what you should do. The Latin American countries were the big examples of that. It was counterproductive. They were not going anywhere with that policy. Then the Asian countries came in. They said, no, let's open up to the world and become part of the world economy. Of course, that was Japan and Korea and Taiwan and so forth.

Burnett: So was it Chicago alone that challenged the East-Coast development orientation, or did they have allies, like-minded people in other institutions, who may not have had the critical mass? I think you might be right in just suggesting that Chicago had this critical mass of many scholars working together in a coordinated fashion, or even an uncoordinated fashion, to challenge some of these myths or dominant narratives about how to develop. But I suspect that there were other people at institutions, even some East Coast institutions, who thought the same way, and there were some collaborations. Is that true? In other words, let me put it this way. Are there non-Chicago people, people not at the University of Chicago, or at other institutions and weren't even students of Chicago, who developed an affinity or relationships intellectually with what was happening at Chicago, and started publishing and collaborating or publishing independently?

07-00:11:26
Tolley: Well, I'm sure there were. I'm not the person to follow it so much. I just made this point in connection with urbanization. It's far more than an urbanization point, so —

Burnett: Yeah. Well, I think we're talking about growth models and the kind of "primal scene" of development. What's your basic fundamental logic for development? And I think on the East Coast, you had the promulgation of a lot of industrial, industry-first orientations.

07-00:12:03
Tolley: Right.

Burnett: And that that was proving to be counterproductive. If you knew that it was counterproductive — your interventions, in terms of publishing actual volumes, is probably early seventies, '73 or so—when did you feel that you had confirmation that things weren't working? Or was it more of a prediction, that you knew from your own economic reasoning, that things were not going to work with these big-push and balanced-growth and industrial fundamentalist, import-substitution industrialization approaches? When was it clear to you that this was really not going to work?

07-00:12:54
Tolley: I don't recall. I'm probably oversimplifying. I'm sure there were people all over the place. Still, Chicago was the bastion of classical economics, and held to that more than other people did. So much of it comes out of that. It's a natural growth; it's comparative advantage and so forth.

Burnett: And respecting the power of international trade —

07-00:13:25
Tolley: Exactly.

Burnett: If you're going to trade, there are certain aspects of trade that you have to respect, in terms of the dynamics of it.

07-00:13:34
Tolley: Right.

Burnett: Right, right.

07-00:13:36
Tolley: The Asian phenomenon is very important there. The term export-oriented growth came into being at that time. It was such a contrast to Latin American growth, for instance, Latin American policy.

Burnett: Right, right. I suppose you had early exposure — and we'll talk of this when we come to the edited volume that you address this in — but you had that early exposure with Korea when you were working on price policy for Korea.

07-00:15:16
Tolley: Right.

Burnett: So with that, was your approach to price policy to essentially mirror what you believed were best practices with respect to price policy in the United States?

07-00:14:37
Tolley: Well, I think that's true. I think I went to Korea when I was still at NC State. I'm not sure about that. But as I recall, that's what happened. I was hired to study the rice problem, and my contract there had nothing to do with growth as such. See, the background was that there was Syngman Rhee, who was the George Washington of South Korea, and he let the price of rice get out of hand.

Burnett: You mean by that too low or high, or too erratic?

07-00:15:29
Tolley: Probably too erratic. They wanted to keep the urban consumer happy, so they tried to hold all the price of rice down. They would buy from a farmer to do that, but it was a seasonal thing. So they would buy rice in the fall and store it, and then they'd start selling it over the year. About June or July, they'd run out of rice and the urban consumers rioted and the whole thing got out of control. They wanted me to come in there to say what was wrong. It was a pretty simple seasonal supply-and-demand situation; it was a technical problem. So I developed a simple seasonal model to understand this and how the price of rice will tend to rise with the cost of storage, because you've got all this rice coming in in October or so and it's got to last for the year. So if you're not

going to consume till February or March, you've got to cover the initial cost plus the cost of storage. That was kind of what it was all about. But that seemed to be some kind of revelation to the Koreans. I noticed that I, as all economists, at least Chicago economists, used simple formulas to illustrate that. The Korean mind, or the Asian mind, whatever, seems to be mightily impressed by formulas like that. That seemed to be an effective part of what I was doing.

Burnett: Or that it could be communicated elegantly was what was compelling about it; is that there were these relatively straightforward relationships and it could be reduced to a kind of essence?

07-00:17:54
Tolley: That kind of thing, right.

Burnett: So they were able to have a kind of counter-cyclical price policy that would smooth out the supply, so you could have a year-round supply of the rice.

07-00:18:10
Tolley: Right, right.

Burnett: So that was an early exposure with technical assistance on the international stage.

07-00:18:20
Tolley: Oh, yes.

Burnett: Now, I'm trying to recall; is that your first foray into international technical assistance? Is Korea your first job in technical assistance on the international stage?

07-00:18:36
Tolley: I think so. I dabbled in Latin America a little bit, but I think that was actually afterward. I certainly remember when Alice and I went to Korea. We landed in Seoul in the limo ride or whatever it was, into Seoul for the airport, which is out somewhere a few miles. What an exciting experience that was.

Burnett: Was it highly urbanized and large, even then?

07-00:19:09
Tolley: No.

Burnett: No, it wasn't?

07-00:19:10
Tolley: No. See, it reminded me of Indian settlements in the US. I think they were small. People lived in small buildings, many, many small buildings.

Burnett: Wow.

07-00:19:27
Tolley: That was there still. This was in '69, was it? But there had already been a lot of development, but it was nothing compared to what was yet to come.

Burnett: So it's part of Syngman Rhee's [plan]? Well, that's the height of the Vietnam War, and the Koreans were suppliers and a staging point for the US military, and they began a lot of economic relationships with the United States that really gave a boost to their development at that time. I think he capitalized on that to really move export industries and the chaebols, the industry conglomerates, forward in steel-making and shipbuilding and that kind of stuff. So that's right at that time, that's what's happening. Yeah.

07-00:20:27
Tolley: Interesting point.

Burnett: But they didn't have enough food, right? Or the food wasn't there at the right time, which is a sensitive problem.

07-00:20:38
Tolley: Well, they didn't have enough rice. Now, the other problem that they faced was that there's a lot of these — should I say false — misleading arguments. They wanted to be self-sufficient in food. Well, meanwhile, their income was growing and they were not eating more rice; they were eating more chicken. And they were raising corn and feeding chickens like crazy, and importing all that. Then it became political. The farmers said, well, now these [other] farmers are taking our business away. So combatting, if you will, the preoccupation with food self-sufficiency was a part of what I was doing.

Burnett: I can understand why, to take a sort of Schultz point of view. If development of a developing country is tied to a kind of integrated commercial orientation of agriculture that requires a pricing policy that permits the purchase of inputs, of modern inputs, to increase productivity, you could see that food self-sufficiency might be a policy that would foster that— in other words, a form of import-substitution agriculture, which I can see by the way that that sounds, doesn't sound like a good Chicago economic policy. But the way it would be done at Chicago would be slightly different. So this food self-sufficiency was a policy that you were seeing in a lot of cases. In the case of Korea, it worked out pretty well, once you got the prices right. Is that fair to say?

07-00:23:03
Tolley: Well, I think the forces of demand were so great. The Koreans were getting better off rapidly, and they wanted meat. They didn't want the rice. I'm exaggerating, but the demand for the import-type goods was growing so much more rapidly that it was like trying to fight a big wall of water coming in. I don't think it's even a concern anymore. Most of the people were in agriculture at that time, and then of course, that influenced the politics. But as that happened, well, for a long, long time, the wages in Korea did not rise. That was a great mystery, a mystery to me, a mystery to everybody, I guess. They

finally, within the past several years — I haven't kept up with events, two or three decades — the countryside finally emptied out, and now wages rose very much. So it was a matter of labor supply there. But that was a mystery. People talked about the big mystery of why wages weren't rising. I think it was fairly simple. There was still just so much labor in the countryside that at the time, it seemed like it was an inexhaustible supply. But it wasn't. You go to Korea today and it can be hard to find labor out in the countryside.

Burnett: But there was a long delay, in part because of a policy of autarchy; that there's something also symbolic about rice self-sufficiency in those countries. If there's been a colonial and a history of conflict and war, that can [have an] influence. Look at the European Union. Look at the Netherlands and the Common Agricultural Policy and the ways in which food self-sufficiency was pursued beyond all reason. But starvation will do that to you in times of war. I think that generation and generations that followed were captive to a mindset that, whatever happens, we need to have our supply of food and it needs to be local, because we can't trust what will happen in the future. That took a long time for them to feel better about.

07-00:25:57
Tolley: I think there's no question that rice, in the psyche of the Koreans at least, was a huge thing.

Burnett: Right. And a cultural symbol, as well, right?

07-00:26:07
Tolley: Right.

Burnett: A historic and cultural symbol. Absolutely. So I think that what you were writing in this chapter, getting back to *The Economics of Urbanization and Urban Policies in Developing Countries*, to move back to this period in the mid-eighties, you argued that urbanization by itself was not necessarily the source of growth, and it could be the increase of human capital endowments that result from having large numbers of people moving to the cities. And the fact that in the rural areas, you have a lot of production for subsistence, and so it doesn't show up in the market data. I think you identify some of the things that we just talked about at the beginning, which was that the rise of what you call primal cities, these megacities. You offer a tentative hypothesis as to why, and you talk about the expensive intercity transport. I think there're probably deep channels of perhaps colonial development before the independence of these countries that also fostered the development of a single port city for the transport of goods out of the country as part of its export economy. So that's one of your contributions to this volume on *The Economics of Urbanization*. You mentioned yesterday Bertrand Renaud, who was a key figure in this book, as well. Did you work with Bertrand Renaud? Was Vinod orchestrating this or were you? Did you meet all the folks who were part of this project at some point?

07-00:28:20
Tolley: Well, that's a good question. I can't recall how I met Bertrand, because as I said, I think he was out of Berkeley actually.

Burnett: Okay.

07-00:28:29
Tolley: But he was at the [World] Bank. We must've gotten acquainted at conferences or something, maybe through Vinod.

Burnett: Right. He talks about what's different about the urbanization in developing countries and the urbanization that was experienced in the United States and in other developed countries. So from your perspective, when you go to these cities and you would analyze these problems, what was different about urbanization in developing countries? What was being pursued, in terms of policies? Or were there policies, with respect to urbanization? Is it something they were pushing, that the governments were pushing?

07-00:29:20
Tolley: I think the governments were pushing it. Incidentally, Bertrand and I were on a World Bank mission to Korea, and Bertrand was one in a group of eight or so people. We must've gotten well acquainted then. He's married to a Korean woman from a noble family of some kind.

Burnett: So he has kind of a family tie to that country now.

07-00:29:56
Tolley: Yes, right.

Burnett: So one of the things that Dr. Renaud is talking about is the pursuit then of decentralization policies. So by the 1980s, they realized that these cities have metastasized into these massive 20-million-people, 15-million-people agglomerations, and that something needs to be done about it. So he talks about the official or unofficial drives behind these deurbanization policies. He has a list of six or seven [causes], but they seem to boil down to nation building. So there's a sense in which in some cases, in Latin American countries, moving populations to border regions that are disputed is important, because the actual boundaries of the nation-state are still disputed between a couple of countries. Or you think of India and its border. So population policies can be pursued in that sense.

07-00:31:17
Tolley: There was big emphasis on infrastructure. The cities were growing and they needed water supply and roads and all the rest of it. I think there was a feeling that they were being neglected, and that was a part of what we were doing in this. I don't know whether Bertrand talked about it or not.

Burnett: Well, I would like to talk about it. It's difficult because it's happening so fast! From your perspective, what was it like? What is it like to advise those in

government, in charge of an urban policy for cities that grow, that double every nine years? What does that look like? How do you even conceptualize that?

07-00:32:18
Tolley: Well, you have to go back. I think you stress the need for expertise. As I say, there was all of this infrastructure growing incredibly rapidly, and they didn't know how to handle it. So I showed them they were playing into the hands of the, not the George Shultzes of the world, but the people who came in from the rest of the world, supplying this kind of expertise.

Burnett: One of the problems that's pointed out is that the city can be growing so fast and the government expertise is to foster decentralization, to try and encourage people to move to other areas, or at least not move to that city. But what was happening is that the drive to move to that city, because the perception that even if there was a reduction in your income, moving from country to city, or a reduction in your circumstances, the long-run future of your livelihood and that of your family was in the city. So you just moved there, even if there were no resources, public services of which to avail yourself. So you have this phenomenon of shantytowns growing up around large urban centers, tapping the electricity supply, so they would pirate electricity. Or they would have no water supply, so you can have huge sanitation problems. It's an enormous problem that you're confronted with. It must have been striking to you to move from thinking about urban policy for, say, Chicago, to urban policy for a large urban center in, say, India.

07-00:34:24
Tolley: Yes, it hits you in the face when you're there. I worked in Venezuela before it was such a mess as it is today. But Caracas has its "Crown of Thorns." The poor people went up on the mountainsides and the lights for their shanties were the very beautiful crown. But anyhow, it was terrible. That was the manifestation of that problem in Venezuela.

Burnett: The crown of thorns is the name of the shantytowns that circle Caracas?

07-00:35:00
Tolley: Right. The lights at night are very pretty.

Burnett: Yeah. But it reveals that there's a lot of hardship in those places.

07-00:35:08
Tolley: Oh, yeah.

Burnett: So there is this question of developing a policy that is going to stabilize those countries. In a sense, I don't know, did you have a sense that irrespective of the policy that was being undertaken—? If it was a product of policy, you would kind of expect it to show up differently, or to manifest itself differently. It seemed to be rapid growth almost uniformly, unless you have tight controls,

as you did in the Asian countries, you had tight controls over movement and it was fairly authoritarian, at least to begin with, with Lee Kuan Yew or Syngman Rhee, a kind of strong-arm approach. But in a lot of the sub-Saharan countries and in other places, the urbanization just seemed to be happening with a tremendous drive. That must've been challenging to undertake.

07-00:36:24
Tolley: I think a lot of it was just calling attention to the magnitudes of the problems, and very little was being done about it. Just calling attention to the need to do something.

Burnett: Renaud claims that even slow-growing cities were growing at 3 to 6 percent per year. He suggests that a kind of urbanization bias was due to industrial and trade policies. There was this industrial push, import substitution, and that there was, in a lot of these countries, a taxation of agriculture, of the agricultural sector, to finance urbanization. Would you say that that's a fair characterization of the problem?

07-00:37:21
Tolley: It's a part of the problem. It may well be. I didn't happen to concentrate on that myself.

Burnett: That fits. If there's a general Chicago animadversion, whether from D. Gale Johnson or Ted Schultz, it would be that import substitution industrialization is not the way forward.

Burnett: I think you agree with that.

07-00:37:50
Tolley: Yes, certainly.

Burnett: —and you have in your writing. I think Renaud also notes that India, until recently, there was an anti-urban policy bias. So by '87, they had switched course; but it was really difficult to reverse. As I said, they would be trying to direct people to smaller towns and get other regional cities going, but people would keep just squatting, effectively, on the edges of the major cities.

07-00:38:26
Tolley: Right.

Burnett: So that was a kind of way to sort of approach development in a blanket sense, with all of these different cases, with a wide variety of different policies and different outcomes that you're wrestling with. Fast forward to 1991. Let me just pause for a second. [interview interruption] So I wanted to move ahead just four years later, another World Bank report. You were the sole author of this one. This one is called *Urban Housing Reform in China*. Well, let's back up and talk, as much as you know, about Chicago economics and China. Theodore Schultz and D. Gale Johnson were there in '79, one year after the

Special Economic Zones were begun. So they're very much in the ground floor of reform in China. Can you talk a little bit, broadly, about what you remember of Chicago and China from, say, '79 to '91, the period of this World Bank report?

07-00:40:07
Tolley: I don't have a very good memory for details, so I guess—.

Burnett: Okay. Well, not really details. I guess just in terms of as far as you know, D. Gale was active in China and was consulting and writing about it. And there were Chinese students coming to Chicago, is that right?

07-00:40:34
Tolley: Yes. So I should back up. There was the agricultural economics workshop, and there were Chinese students there. They were writing about the reform, the agricultural reforms in particular, in '78, massive shifts and so forth. So I was picking up background just automatically, through that.

Burnett: Was this still the same setup where the, "ag group" —you and D. Gale. Ted Schultz retires in 1967, but he's still coming into the office, he's still coming to the workshops, certainly into the seventies and the early eighties, is that right?

07-00:41:27
Tolley: As far as I know. Again, I don't remember the years.

Burnett: Right, right. Yeah, years bleed into one another, don't they?

07-00:41:34
Tolley: Yeah.

Burnett: So there's that. So for urban housing reform in China, this volume is about the proposed housing reform in 1988. So now this is ten years into the experiments in market reforms, and they're thinking now of liberalizing the housing market, which as far as I know, was a kind of Soviet-style quota system, a rationing system, where the housing was free, but you might have to wait half of your life for you or your family to get access to a very small apartment or house that you would be able to live in, that was provided by the government. They wanted to move to a market system. So I'm wondering if you could talk a little bit about that experience. Did they ask the World Bank, or did the World Bank ask you to do this report, and then you went to China? Did you do your ag economics approach: "I need to go and see it to understand what's happening?"

07-00:43:00
Tolley: Well, again, I should remember the details. It's probably the World Bank that involved me in the housing thing. To paraphrase what you were saying, the Marxist view of housing is, it's not a good; it's just a cost-of-production, and they don't let it into economic thinking at all. So at that time, then, the lip service to free markets in China was rampant, and they said, we're going to

privatize housing. Well, here are all these workers. They didn't own their housing or anything. So they dreamt up a system whereby the workers would pay a certain amount per month and they would end up owning the housing. Actually, that was the system that I or we brought over there to — I'm trying to recall what the mechanism was. A lot of it was one on one. However, we were to evaluate that system. It was a rather cumbersome thing. It also involved the placement of new housing, and the Chinese did not understand the [William] Alonzo point that people make tradeoffs between traveling to whatever they're going to do and paying for a place to live. So they were all confused about that. So that was the system that was being evaluated at that time. I think a lot of that book you're referring to was oriented toward that. It was really a rather cumbersome system. In retrospect, I don't think it lasted all that long. It was just kind of a five-year period. Things were moving so rapidly that a great deal of the housing market has privatized on its own, and there was enough new money splashing around so a lot of people could afford to buy their own places.

Burnett: It took care of itself, basically?

07-00:45:48
Tolley: Yeah. That's one of the problems of studying China. I wanted to mention, I've been running a China workshop for many years. It's so hard to get something figured out. You go back and it's not there anymore.

Burnett: That's right. The phenomenon you were studying is gone.

07-00:46:07
Tolley: That's right.

Burnett: It's been paved over. It's a fascinating story. It's this dilemma of mixed housing, and it's a fascinating question, and one that was being dealt with in different ways in different countries. With the fall of the Soviet Union and the satellite states, there was the famous shock treatment, like Jeffrey Sachs following on Milton Friedman's advice to just turn it into a market society kind of overnight, and let the chips fall where they may. That's been another notch in the notoriety, I suppose, of some Chicago approaches, which belies, actually, a kind of gradualist orientation of a lot of the Chicago people, yourself included, and D. Gale Johnson and Al Harberger as well. You have to do things carefully and subtly, not jarringly. But reading it, it's kind of painful, because how do you deal with mixed housing, where people pay rent on a house that is owned by the government, but the rent is very subsidized? You can buy a house; you no longer pay rent. But because rent is very subsidized, there's real reduction in the price buyers of homes or would-be buyers of homes are willing to pay. Right? So in a sense, it never gets started, because of the subsidies. On the other side, there was this notion from the Chinese government that, well, we understand we need to raise wages so they can afford to buy houses; but it was never enough, and it was such a uniform

market. So your advice to them was to liberalize things, to allow for differences to emerge, so that you can have a range of different options, because it was a bit too cookie cutter. Basically, what you were saying is, consider more market reforms. Consider widening the size distribution of wages, for example, as opposed to a kind of equity system of a socialist economy. So that would essentially allow a kind of housing market to emerge. This is the key kicker: if wages are raised across the board for both the people who rent at below-market rates and those who buy homes, then the people renting get a windfall. So that's your economic analysis being applied to this, and this wasn't being appreciated by the Chinese government. It's interesting because it's speaking, in a sense, to fairness, right? So you're actually advising the Chinese government, saying that your mixed socialist system here is not going to work because it's not fair. So that was kind of an interesting position to find yourself in.

07-00:50:00
Tolley: Yes. [laughs]

Burnett: So it's a brief window onto a changing economy. How many times did you go to China in your career? When was the very first time? Was that the first time, going in the late eighties?

07-00:50:22
Tolley: It probably was. I remember being in Hong Kong. I must've been on my way to Korea. That was before Nixon [prior to 1972], I think. I remember being in Hong Kong and looking over at the mainland and saying, "Gee, that's China. That's another world." So that must've been at that time.

Burnett: Right.

07-00:50:48
Tolley: When did I go to China officially? It might've been at that time. I went back a time or two after that, but I haven't been in China all that much. I wish I had been more.

Burnett: Well, speaking of this, in spring of 1995 — now it's four years later — you're a visiting lecturer at Nankai University. From what I could gather, that's one of the first universities in China to have a comprehensive economics program. Is that right?

07-00:51:34
Tolley: Well, it might be. I was lecturing straight economics, both there and then we flew down to—not Shanghai, Guangzhou?

Burnett: Guangzhou?

07-00:51:46
Tolley: Right. But yes, they were lapping up economics very much.

Burnett: Right. But do you remember how that happened? You were approached by them and they asked you? You took a sabbatical leave, or how did that take place?

07-00:52:03
Tolley: I was invited over. I'm so terrible on names. A faculty member from Nankai invited me over, and I went there. On one of the trips, we went up to Manchuria and studied a lot of gigantic private housing developments, I remember that.

Burnett: In Manchuria, yeah.

07-00:52:30
Tolley: Yeah.

Burnett: Because 1995, things were already changing very rapidly.

07-00:52:37
Tolley: Oh, yeah.

Burnett: So if your World Bank report came out in '91, then let's say you were there in '89 maybe, or—?

07-00:52:51
Tolley: Maybe. I'm sorry, I don't know.

Burnett: Then just four years later, you would've seen a big difference, you would've seen a change. So you witnessed that. So we are talking about the 1980s and into the 1990s. We know from our sessions, and other sessions I've had with other Chicago folks, that Chicago has long had a voice with respect to international development, especially when it comes to agriculture. In the sixties — I'm wondering if you could comment on this — T.W. Schultz made a huge splash with *Transforming Traditional Agriculture*. It comes out in '64. By the end of the sixties, it's translated into eight or nine different languages; it's gone through multiple editions. So people read it and pay attention to it. D. Gale Johnson has a similar impact with *World Agriculture in Disarray* in 1973. Your book, *Trade, Agriculture, and Development*, 1973. So Chicago economists are speaking about international development. And then there's the Chile project, so they're training generations of people in developing or middle-income developing countries, in Chicago economics, and they're actually having a policy influence during the 1970s, through the Pinochet regime and so on. So there's a lot happening with respect to Chicago economics. But as far as the literature on development, all you hear about when you read the history of development in the decade of the sixties and the seventies is the East-Coast development advice, the modernization theorists. Nobody, at least since I looked recently, nobody's been talking about Ted Schultz or D. Gale Johnson, in terms of the history profession. So the historians have not picked up on this. So what then happens, in terms of

political history, economic history, and the history of international development, is that suddenly in the 1980s, there is the arrival of Ronald Reagan. George Shultz becomes secretary of state, and in the development area, you have the rise of something called structural adjustment. It's at that point in the 1980s, people start talking about the long arm of Chicago economics and that it has transformed things all of a sudden and surprisingly. So I'm wondering if I can get your Chicago perspective on that shift from the 1960s, of publishing about international development, giving your advice about agriculture pricing and that kind of thing, up into the 1980s. What is your perception of the reputation of Chicago, with respect to international development, from the sixties through into the eighties? Is it something that is gradual? It's not something you really considered, or is it something that was picked up in a public sense in the 1980s, that the World Bank is saying the people you trained should be in senior positions in our organization. Is it something that really, really takes off in the 1980s?

07-00:56:52

Tolley: I wouldn't say it takes off. To my mind, there was never any— There was *Transforming Traditional Agriculture* and all the rest of it, and that had flipped the world. Then as far as I know, it never unflipped after that.

Burnett: It was that big of an impact for you?

07-00:57:16

Tolley: Yes. Now, it could've been in my own mind, but for me, that's what it was. Oh, it had a lot of different manifestations. I certainly, I don't know whether I flipped; it's not quite the same, but I was becoming more and more interested in economic development, even though I wasn't writing directly on that. But in doing that, you see that the Soviet countries just fell further and further behind. I'm not an ideologue at all, but the students, left-leaning students, would come and say, "What about this in the Soviet Union?" I'd say, "Just look at the facts here." To me, it was all kind of proven and I didn't ever question it after that.

Burnett: It's D. Gale Johnson who wrote extensively and did some work, I think, with Arcadius Kahan?

07-00:58:26

Tolley: Yeah, they were very close.

Burnett: They were very close. Okay.

07-00:58:28

Tolley: Oh, yeah.

Burnett: Yeah. I think Arcadius Kahan, was he in the [U. of Chicago Graduate School of Business] business school?

07-00:58:36
Tolley: Where was Arkady? Most of the time, he was in the workshop. I never knew where he was in the School.

Burnett: I think it's neither. I'm going to have to get back to you on that because I think it might be something as interesting as political science or—. [Professor of economics and history in the Economics Department at the University of Chicago]

07-00:58:52
Tolley: Something.

Burnett: Yes. He's a multitalented person.

07-00:59:00
Tolley: I think he and Gale were working for the CIA. I never said that, but I always thought they were so heavily involved in Soviet agriculture that I assumed that that was—. But that's just a side comment of some kind.

Burnett: Well, I'll tell you—and this is a nod to another oral history that we've done with George Shultz. I think George Shultz mentioned Arcadius Kahan. I'm not quite sure; I never quite got the timing of it. But he said he instructed the CIA to look at ag data. He was, I think, influenced by D. Gale Johnson and Arcadius Kahan. So it's kind of the other way around.

07-00:59:48
Tolley: Oh, it might be.

Burnett: It's that through him, he influenced the Central Intelligence Agency to check up on that. That became an instrumental part of Shultz's negotiations with the Soviets during the Cold War, because he knew that their agriculture was on the ropes. So that's a fascinating Chicago connection to high politics and diplomacy. So you just said that you were aware of this, but there was this active— I don't want to say a research program—but it was a consistent passionate interest of D. Gale Johnson's. He was writing about this in the fifties and sixties, and Arcadius Kahan, as well. They were working together on gathering this data. The conclusion was that it wasn't doing well. China was even worse, because of the Great Leap Forward, which was a great leap backward—

07-01:00:54
Tolley: That's right.

Burnett: —in terms of productivity and then the Cultural Revolution. So the destabilizing effects of killing off and imprisoning many of your scientists and thoughtful people. They lost a generation, at least, of technical expertise. And they were not really able to feed their populations. I know this as a historian, just to set further context to this conversation, that the very first order of business between the Nixon administration and the Chinese, when he made

his famous trip to recognize China and to open up China, was the negotiation of the sale of four Brown & Root ammonia fertilizer plants. So it was about American and Western high-technology industrial inputs for agriculture that the Chinese did not have. It gives you a sense of what the stakes were, in terms of the relative capacity of Western countries to feed themselves, versus the Soviet Bloc and the Chinese. So there's that, when it comes to wrestling with agricultural policy. There were policies that were being pursued that seemed to just not function according to your understanding of how agriculture works. So that's the context in which you find Chicago economics coming into the 1980s. I think maybe a way into talking about this is perhaps to talk about structural adjustment. Can you tell me, essentially, give me a potted history of what that is and what was happening in the 1980s, with respect to this thing called structural adjustment?

07-01:03:10
Tolley: Well, I was not a part of that movement; I'm only observing it. I think to me, it suggests there's something fundamentally wrong with the way the thing is set up and that you need to make these fundamental changes. But then as you're describing and as other people described it, sometimes it means the shock treatment, and that's quite a different thing.

Burnett: Well, in 1982, I think this is your very first report with the World Bank. It's *Agricultural Price Policies in Developing Countries*. This is with Vinod Thomas — so this is the first one; the one we were talking about earlier is five years later — and Chung-Ming Wong.

07-01:05:08
Tolley: Yes.

Burnett: Is Chung-Ming Wong related to Chicago at all?

07-01:04:14
Tolley: Yes, I very seldom recall his name. He was very key, very important person. He must've been a student here.

Burnett: I think yes, but we'll double check and footnote it if it's not correct. What's interesting, in the comments, thanks are given for reviewing the reviewing the manuscript, to T.W. Schultz, D. Gale Johnson, and Bruce Johnston, among others. There was a long list of people who were not at Chicago, so we should be fair and say it wasn't just a Chicago publication through the World Bank. But again, it's the ag group as a key force in shaping policy.

07-01:05:08
Tolley: Right. Bruce was at the Food Research Institute, of course.

Burnett: Yes. But he was a student, wasn't he, at Chicago?

07-01:05:17
Tolley: I don't think so.

Burnett: No? Okay. Well, I have to revise that. [PhD, economics, Stanford University]

07-01:05:19
Tolley: Bruce and I worked—. We were quite simpatico. I don't know why we worked—. Let's see. What was the group out of New York City? The Rockefeller group. Anyhow, I would see Bruce at these—.

Burnett: IFPRI, the International—. [International Food Policy Research Institute]

07-01:05:36
Tolley: It was not IFPRI, it was before IFPRI.

Burnett: Oh, I think I know what you're talking about. Now I'm just blanking myself.

07-01:05:46
Tolley: Anyhow, it was the Rockefeller group. Anyhow, I met Bruce at that. I guess we didn't write anything together. We might have.

Burnett: It sounds to me like the basic message—and there's something called SECALs, SECAL. Those are the agricultural equivalent of structural adjustment policies.

07-01:06:16
Tolley: I see.

Burnett: So just before this stuff gets rolled out, this publication comes out. So it's carefully argued, but basically, the line that stands out: "Price incentives can speed up the adoption of modern inputs, and thus provide long-term benefits." The thing that comes home to me is that this is the policy advice of T.W. Schultz in 1943, when he was writing as the chair of the agricultural policy committee for the Committee for Economic Development. So this has been a consistent refrain coming out of Chicago, that get the prices right and everything else is going to follow. Some of the new suggestions in the evaluation of the cases that you're going to be looking at in this book, there may be an overestimation of price stabilization effects, because it's often been held that a price policy is to stabilize agricultural prices and that that has this virtue in smoothing out the kind of back end of the industrial side of this agricultural economy. It's then followed by four case studies. Korea is one of them. We've already talked about what your research was about, and it's featured here. The conclusion that you come to in this, at least by 1982, is that the high agricultural price policies in Korea have permitted greater efficiencies in agricultural production and have successfully led to self-sufficiency. Whether or not that's desirable, I think you were carefully agnostic about that. But it's portraits of four different types of agricultural policies. There's the Korea case, which is about seasonable stabilization. Then there's Bangladesh, which has input subsidies, with the goal of food self-sufficiency. It's an interesting contrast because food self-sufficiency is achieved in Korea, and in Bangladesh it's not. Now, that's not necessarily fair,

because they're two different countries with two different histories and two different sets of challenges, so it's a bit unfair as a comparison. But can you talk a little bit about that contrast? Because in Bangladesh, it's input subsidies. So what can go wrong with, say, input subsidies in Bangladesh or India? This was a popular approach for a long time. It was a popular approach for the Green Revolution, wasn't it?

07-01:09:33
Tolley: Oh, yeah. It was at the heart of the Green Revolution.

Burnett: Right. And so you need these ingredients to: you've got high-yielding varieties coming in and you need water, you need fertilizer in large quantities, and you need the seeds. That's a package that goes together. So what's wrong with that? Why is that a problem?

07-01:09:54
Tolley: Well, maybe it's not. I don't know Bangladesh well at all. But Korea is an authoritarian culture. We used to say that the minister of agriculture would say, "Increase your fertilizer by 10 percent." Everybody in the country, the next week, does. It's probably left over from—the Koreans owe so much to the Japanese because they brought the economic development mentality to Korea, and people in Korea buckle down and do things.

Burnett: They're enjoying the fruits of decades and decades of hard, hard work.

07-01:10:50
Tolley: Well, I think they are. Yes.

Burnett: But at any rate, I think one of the evaluations and assessments in response to this research is that the input subsidies can have adverse effects: they drive up the production and drive down the prices. I think the argument is that it acts as a kind of tax on agriculture. So it's a subsidy to people in the cities. They want people to migrate to the cities and it subsidizes the poor and the working population there; but it's provided through a tax on agriculture. Now, that's a difficult question in agricultural price policy for development, because how do you do it? If you're a developing country, and let's say two-thirds to three quarters of your population is in agriculture—in your developmentalist mindset—you want to effect a shift because urbanization is considered to be a good thing, and you want a supply of workers in the city to undertake industrialization. So you pursue policies that tax agriculture in different ways, but ultimately, that provide the revenue with which to have statist projects, to have even export-oriented projects. So why is that a problem, from a Chicago ag group perspective? What's wrong with that position, taxing agriculture to foster industry?

07-01:13:00
Tolley: Well, I'm just free associating here. It's interfering with the market.

Burnett: Yeah, okay.

07-01:13:11
Tolley: I worked some in public finance. I think the idea of benefit taxation is very powerful, and that would be my bias. Again, I was in tax policy for a while in the government. Anyhow, my bias is that you look at the effect of taxes on the people, on what the more immediate effects of the taxes will be and you'll do better—this is a Milton Friedman point—than mess around with policies. These things can get terribly screwed up if you get distracted by policies that are too far afield. Again, that's off the cuff.

Burnett: Oh, I like off the cuff. We can go even further off the cuff if you want, and I could ask you a general question. In all the years that you were doing development work— This is something that Al Harberger would come up with. He had these stories about policies that seemed counterproductive or "screwed up." Can you think of cases where you encountered, in your work going to different countries or reading about different countries' policies, that just seemed screwed up from your perspective?

07-01:14:46
Tolley: Well, I'm not sure, but I think one of the major points of the book on agricultural policies was — again, this is my own thing — people who are going to carry out these policies need to know what the effects are going to be. The policies get screwed up because they don't realize — or they succumb to pressures that help them not realize — that there are going to be some very adverse effects. I think that was one of the major things, in my mind at least, that we were trying to get across.

Burnett: I think there's an obvious answer to this question, but if you have a policy — let's take the example of subsidizing inputs — that creates a stakeholder in the supplier of that input. So let's say you're a domestic Indian fertilizer company and the government subsidizes fertilizer, so you've got this kind of guaranteed market. Is that an example? Then they do well and they exert political pressure to keep it going.

07-01:16:08
Tolley: It could be. I've never thought of that example, but it certainly could be, yes.

Burnett: So people become invested in "the way things are," and they don't want things to change, and they exercise a brake on the transformations that could take place if there weren't those distortions, if there weren't those stakeholder pressures?

07-01:16:41
Tolley: Yes, I think that's right.

Burnett: Yeah. I want to move on, then, to a 1994 volume that's called *Technical Change in Income Distribution in Indian Agriculture*. It's David G. Abler,

George Tolley, and G.K. Kripalani. David Abler, was he connected to Chicago?

07-01:17:06
Tolley: He was a student there.

Burnett: He was a student of yours?

07-01:17:09
Tolley: Yes.

Burnett: And Kripalani has a connection, too. Can you describe how Kripalani is known to you?

07-01:17:19
Tolley: Well, I'm pretty sure, as we were talking earlier today, three senior postdocs moved from Raleigh to Chicago when I came here, and Kripalani was one of them. We had a long relationship. He died. I went to his cremation. At that time, I guess when those projects ran out, he moved to Kalamazoo, Michigan, and that's where Vinod went as a young student from Kerala, India, and G.K. [Kripilani] took an interest in him and sent him here, and that's how I began working with him.

Burnett: Okay. So he fostered the connection between you and Vinod Thomas.

07-01:18:09
Tolley: That's right.

Burnett: What's interesting about this volume, and what I appreciate about it, is that it talks about the history of models of development, and it walks the reader through. It does recapitulate some of the history of the zero-marginal-productivity models of Arthur Lewis and the Fei-Ranis theory in '64, up through a number of models in the sixties, and up into the eighties. In this lineage, there is the Tolley-Smidt model. I found it kind of interesting and I wanted to run this by you. So this is in chapter three. It's titled "General Equilibrium Growth Models," and it basically sets up the research that was being done, and I think helps us to get a sense of what's happening. The conclusion is that there's a lot of studies that were done after Arthur Lewis' original surplus model was promulgated in 1954, into the 1960s, arguing that there was little evidence for zero marginal product of labor. So this is something that Schultz argued against from first principles, and with some evidence. But it was followed up with a number of studies into the sixties and seventies arguing that it's not true. There are some efforts to bring it back in. I think Amartya Sen, in 1966, argued that zero marginal productivity could be assessed by treating the family as the unit of utility. So you'd find that if the family unit is the economic unit, one person might be working and then other people not. That's a terrible representation of his argument, but basically, all this to say that it died a slowed death. I think it was considered to be plausible

for a long time, the zero marginal product of labor. People were clinging onto it for quite a while. One of the things I wanted to run by you, too, is this efficiency-wage model. Do you know about this, this idea that basically, minimum nutritional requirements are not necessarily being met for agricultural laborers in very poor countries? So there's a real productivity gain for employers of agricultural labor to pay, at least so that the workers have the minimal nutritional requirements made to actually do the work. So that they're, again, looking at developing countries as having special economies and special circumstances that don't apply to developed-country economics. If people are starving on their feet, it's reasonable to assume that you would have productivity issues and perhaps moral and political issues on top of that, as well. So I can understand why you might to have a kind of discrete theory that treats developing countries, really poor developing countries, slightly differently, with a different set of metrics. Do you agree with that? Or do you think that that's more of the Lewis line of saying, we need a special kind of economics to address a special set of economic circumstances?

07-01:22:40

Tolley: Well, I may have a bias in responding to this, but people, way back then, thought, well, there's developing economies and there's undeveloped economies, and they're completely different things and you analyze them very differently. I must say, I would then bring in regional economics, and it was the same thing. You analyze the national economy or the micro economy and you used Adam Smith and his derivatives, and that did it. But the people came along to regions and cities, they say, well, this doesn't apply at all when you use these mechanistic multipliers. It's the same thing. To me, I don't accept it. I think the basic framework is economics is economics, and it's the same everywhere. I'm sure there are many exceptions like this, but I wouldn't use it as the paradigm, as the way of viewing these things. To me—and I may be wrong—they're special cases.

Burnett: Well, it seems like that's the orientation of this description or history of models. Then it moves to talking about two-sector models. By that they mean an agriculture sector and an industrial sector, or city-urban sector—

07-01:24:17

Tolley: Right.

Burnett: —and the relationships between them. So that's [Dale] Jorgenson, from 1961. Tolley-Smidt is part of this, and this other model that I won't go into. It's three separate economists. To me, what was interesting is that yours was the only one of these three that at least could be open in its model. So these are closed economies, and in yours, the ag sector is open to the world market for its products. I thought that that was significant. Is the Tolley-Smidt model ahead of its time, with respect to open-economy macro, and as far as the development literature goes?

07-01:25:19

Tolley: Well, I happen to think so. As we were talking, I was making a list of things I would like to make sure we cover, and the Tolley-Smidt was one of those things. It was not only that; it was one of the first of those two-sector, general-equilibrium models. I think the dates will verify that.

Burnett: Yeah. Tolley-Smidt is '64. This is a history that presumably, you had a hand in writing, so I don't want you to contradict yourself here. But Jorgenson is '61. So that's a two-sector closed economy. But according to this path, it's the first that allows for one of them to be open to the world market, which changes everything, I think.

07-01:26:16

Tolley: It's crucial.

Burnett: Yes, because that is fundamental; it's why all the debates around agriculture policy in the United States would always founder on that, because people were saying, why can't you just make the price this? And it said, well, because it's a world market. So sooner or later, you're going to have some kind of gap, and possibly a gigantic gap, between the world price and the price that you want to be paid.

07-01:26:42

Tolley: Right.

Burnett: So it's another instance, I think, of the connection between domestic agricultural policy in the United States and [Chicago] ag economics wrestling with that, learning lessons from it, and then saying, this set of lessons can be applied to other countries, not necessarily in a cookie-cutter way. Of course, each agriculture economy is different: different crops, different climate, different people, and different relationships among other countries. But fundamentally, there are some problems with statecraft and the manipulation of markets that Chicago ag economics, and agricultural economics in general, I think, grappled with and came to conclusions about before the development discourses took off. So there was already an understanding of what the pitfalls were before economists started saying, "well, this development is going to have to happen in this particular way; this is a special case." So that's an interesting approach. I did want to ask if you knew anything about Alain de Janvry. He's at Berkeley. He's a Berkeley ag economist. He's emeritus now, I think. But there's a de Janvry-Subaro model, from 1986. It's so late in this lineage here. It's argued in this book that it's a model much like that of [W. Arthur] Lewis. I'm assuming in the disguised unemployment sense or zero-marginal productivity of labor sense. It assumes that a nominal wage is constant. So I think it's yet another indication that the disguised unemployment/ zero-marginal productivity of labor, it lasted from the mid-fifties, and there were still versions of that coming out in the mid-eighties. So it gives you a sense that this was a long conversation, it seems, between experts, about how best to develop an agricultural economy. So anyway, the

whole book is about a model simulation of technical change in India, using data from 1960 to 1987. It had different regions of the economy. There's the north and south, and I don't know if it's east and west or, but just versions of that. It's interesting. The most change was in the north. They're divided into two different types of technical change: mechanical-augmenting change—and that's presumably mechanization—and input-augmenting technical change, which is fertilizer and chemical pesticides and things like that. One of the interesting insights is that the land-augmenting change, which is like the input-augmenting technical change, was after 1974, which is kind of after the Green Revolution has done its thing, which is interesting.

07-01:30:32
Tolley: Yes it is.

Burnett: The greatest change is in the north. And the answer is because agricultural wages were higher there.

07-01:30:44
Tolley: I see.

Burnett: Now, as usual, you acknowledge the biases and weaknesses in the statistics, but it's a very carefully-argued position. But what's striking to me, having read all of the literature about searching for *r*, searching for that residual technological growth, it's usually just this leftover category and it's just a number. There's no way to sort of bottle it or capture it. This is one of the first instances where you're disaggregating by region, and by doing so, you're able to look at different types of agriculture and different circumstances. So it's an area of high wages, relatively speaking, and it's disaggregated types of technological change: input-augmenting and mechanical- augmenting. I really appreciated that there was an effort to do a fine-grained analysis, over a period of twenty-seven years. So this is a massive project. I appreciated that there was this analysis that went into looking at technical change in India. So that is an interesting instance where you have gone over all of these different approaches to agricultural development and looked at the limitations of them.

I did want to ask you about another topic. Getting up to two years later, this is part of a kind of celebration of D. Gale Johnson's work. It's in the second volume of papers about D. Gale Johnson. Can you talk about that? It was a festschrift, basically, right? That there was a multi-volume set; one that was a compendium of D. Gale Johnson's papers, and the second volume was papers that are in the spirit of D. Gale Johnson. And this is one that you had written with Vinod Thomas and others.

07-01:33:51
Tolley: Yes. I think there was a conference in connection with the second volume. Probably the first volume was, I don't know whether that was done before he died or not. But anyhow, there was a big conference here, and a couple of his students —

Burnett: Yes, he was alive. I think he passed in 2002 [ed. note: 2003].

07-01:34:16
Tolley: I can't remember the year, exactly.

Burnett: Yeah. So this would've been in '94 or so.

07-01:34:22
Tolley: I see. Well, maybe he was. Okay.

Burnett: Yes. Which is really lovely.

07-01:34:26
Tolley: Yes.

Burnett: So I thought this paper was really interesting. It's written by you, Vinod Thomas, John Nash, and James Snyder. We know Vinod Thomas by this point, but can you talk about John Nash and James Snyder? Were they also students?

07-01:34:51
Tolley: Yes, they were. Now, John Nash was at the World Bank. I knew him quite well, as a student here and after he was there; but I never worked closely with him. He was a very, very able Chicago economist. Jim Snyder, I should know more about him. I can picture him very well. Do you recall if it says what his connection was?

Burnett: That, I would have to look up. I don't have it quite with me right here.

07-01:35:28
Tolley: Anyhow, he was a part of the Chicago team.

Burnett: Okay. And this was a part of this growing ag group at the time.

07-01:35:36
Tolley: Right, right.

Burnett: Growing development group, I suppose, as well. The connection to D. Gale Johnson is that it cites D. Gale Johnson's article in Ted Schultz's edited volume, *Distortions of Agricultural Incentives*, which was published in 1978. It asks the question, why are good agricultural policies so rare? It does lay some of that at the feet of import-substitution industrialization. The price policies in ISI kept domestic agricultural production and pricing lower than what they call border prices. Border prices means the world price, effectively?

07-01:36:30
Tolley: Right.

Burnett: Okay. So this is again part of the multi-decade friction between T.W. Schultz and D. Gale Johnson, you and others, on the one hand, and Raúl Prebisch and

a whole group of economists and policy-makers who were very strongly in favor of an infant-industry protection of a domestic industrial sector that would be supported, in part, by low agricultural prices in their agriculture sector. So if you are administering your agricultural economy in that way in a developing country, how do you do that as a government? Is it done through kind of these marketing agencies? How do you manage your agricultural economy in this way, if you're doing import-substitution industrialization? Or these marketing agencies or parastatal agencies that—. In Canada, there was the Wheat Board, which was recently dismantled. But they make purchases of a single commodity across the board, and then they sell as a bloc and they're able to negotiate a somewhat higher price. But is that one of the techniques for controlling agricultural production and pricing?

07-01:38:17

Tolley: Well, sure it is. Obviously, your coffee boards all around the world, they use these things.

Burnett: Right, right. One of the striking statistics — and it comes from a publication of Nash, Nash and Knudsen, in 1990 — argues that the losses of parastatal marketing agencies typically equal several percentage points of a country's gross domestic product, which I found particularly shocking. I know about the losses and the accumulation of stocks of the CCC in the United States, and by 1965, they had Liberty ships filled with grain and they were putting grain in abandoned railroad tunnels and mines and things like that. So it's a dramatic story, in the fifties and sixties, of the accumulation of stocks. I wasn't aware of how extreme some of these marketing losses could be in these other countries, just in order to indirectly subsidize or pursue a policy that was privileging industry. Or maybe that wasn't just privileging industry; I don't know explicitly. But several percentage points of GDP, just for the losses of a marketing agency for an agricultural commodity, sounds like a lot to me, and quite a burden.

07-01:39:51

Tolley: Yes.

Burnett: So the argument in this paper is that the subsidies could lead to over-valued exchange rates, and that would indirectly hurt agriculture. How does that work? If you have subsidies that cause over-valued exchange rates, how does that hurt agriculture?

07-01:40:21

Tolley: Well, it raises the price of the agricultural commodity and so it cuts down on the sales.

Burnett: So people purchase less of it and they go elsewhere and get a lower price.

07-01:40:29

Tolley: Yes.

Burnett: Okay. All right. So the argument is that agricultural prices were kept artificially low domestically, and I guess kept off the market. That's one thing, and that drives up the price of what's being marketed on the world stage? Is that right?

07-01:40:53
Tolley: Yes, that's right.

Burnett: It's complicated stuff.

07-01:40:56
Tolley: Yes.

Burnett: But the agricultural prices were kept low to support import-substitution industrialization and keep inflation and wages low. So it could result in 40 percent lower export prices, while reducing domestic import prices by only 6 percent. So anyway, there are distortions in this. So structural adjustment as a condition of continued support and loans from the World Bank or the International Monetary Fund, countries that were in financial straits, if they wanted to continue receiving money, they would have to agree—. They would get loans, but in exchange for the loans, they would agree to alter the structure of the economy, basically. So this paper argues that structural adjustment was good for agricultural export prices, at least in a quarter of the countries that undertook the reforms. One of the reasons I wanted to talk about this paper was that there's a lot of literature about the consequences of structural adjustment, mostly arguing that it had negative effects on the things that states, newly independent states, developing states, were paying for: health services and education were two among them. Structural adjustment had a negative effect on education and healthcare, because there was less money available for those kind of things, in order to get their finances in order as a government. But it did sort of rectify some of the strange imbalances in the agricultural sector that were part of the story. So it's an instance where there's a defense of structural adjustment. Is that something that was being wrestled with by the people in the agriculture group? Was structural adjustment something that needed to happen for these countries to move forward in their agricultural policies?

07-01:44:00
Tolley: It may have been. To the ag group that I was part of here in Chicago, it was not a central thing. When you get very deeply into international agriculture, you run into these marketing boards right away. But I don't know what Gale thought about them. The concern was more with the domestic agricultural situation, if you will.

Burnett: Right. Well, so the consequence of the reform is, ideally, a reduction in subsidies, right? But one of the interesting pieces of advice that's coming out of this paper is that if you reduce your agricultural subsidies, you must increase spending on research and development and infrastructure. So that, to

me, reflects a kind of core piece of the Chicago ag group's orientation towards market interventions by the government, in the agricultural sector. If the intervention is to promote research, to promote agricultural extension, to promote infrastructure that's going to facilitate the greater integration of the agricultural and the industrial economy and the purchase of inputs and the sale of agricultural commodities to industry, then that is positive and should be supported. But subsidies for some other goals, like import substitution or minimum nutritional requirements, is not necessarily going to be as interesting to the Chicago group. They're much more interested in government intervention in the agricultural economy to support modernization, agricultural modernization. Is that a fair characterization?

07-01:46:22
Tolley: Oh, yes. Yes, I think it is.

Burnett: Yeah. Okay. So that's, I think, the basic set of projects that you were involved in between urban economics in developing countries and agricultural price policies in developing countries. Because we've just been going kind of text by text, are there aspects of those years that you'd like to fill in, in terms of your work, your research work, just with respect to international development, collaborations that you undertook that might shed more light on your career?

07-01:47:29
Tolley: Golly, there may be, but I think this has pretty well covered it though.

Burnett: There are a couple of papers in there that we didn't talk about; but they seem to be folded into the larger volumes that you were involved in. It does speak to student relationships. Each one of these projects is with a Chicago student or a postdoc that you had worked with, and sometimes had been working with for a long time. Your first collaboration, in some ways, with Vinod Thomas is '73. When was the last time that you worked with him? At least 1996.

07-01:48:23
Tolley: Yeah, that's true.

Burnett: At least as long [ago] as that.

07-01:48:26
Tolley: Yes.

Burnett: Yeah. So twenty-three years. So these are long collaborative relationships and friendships that you had over these periods.

07-01:48:37
Tolley: Yes.

Burnett: Well, why don't we pause for now, and we'll take up the next phase of the story, because there's multiple hats that you're wearing.

07-01:48:53

Tolley: Yes.

Burnett: This just covered George Tolley as development expert.

Interview 8: June 6, 2018

Burnett: This is Paul Burnett interviewing Dr. George Tolley for the Economist Life Stories project. We're here in Hyde Park, Chicago. This is June 6, 2018, and this is our eighth session. Today I'm wondering if we can continue to talk about the 1980s, but also continue to talk about this large, multi-volume project with [publisher] Ballinger, on environmental policies. So you, with Philip Graves and Glenn Blomquist and a number of others, coedited and co-wrote five volumes on environmental policy. In session five, about fifteen minutes into the second hour of session five, we talked about the first volume, which as we discussed, was a kind of blueprint for how one might go about establishing environmental policy. It wasn't policy prescriptions per se, but it was about how you would set up a framework for environmental policy analysis. But I came across something from 1975. It was part of a National Bureau of Economic Research edited volume. The editor was Edward Mills. It was called *Economic Analysis of Environmental Problems*, and you wrote a paper for this. It was called "Resource Allocation Effects of Environmental Policies." It helped me to think about your thinking and the context in which you worked. One of the things that you say is that a lot of the assessments around environmental policy are often qualitative. That's one thing. They often just evaluate a single intervention, like a catalytic converter — what will catalytic converters do to environmental quality — and look at it in a fairly simple way. Or an environmental intervention in terms of handling the cost of it — taxation. That's the traditional tool, is to tax. So that's one of the things that you're talking about. What you say in it, which I found very interesting, "We need a framework to systematically compare policies and the indications of how effects depend on underlying demand and production conditions," so having some kind of way to standardize the evaluation of environmental policy interventions, their costs and their benefits. So in 1975, you are thinking about this project, or what becomes this project, well into the 1980s. I think the last volume for Ballinger is 1987. So this is a long project. In 1975, you were addressing it and plotting it, as far as I can tell, and you set up a number of problems around it. But what was interesting is that the people that you cite, this sounds like a Chicago roundup. You've got Gary Becker; Jim Buchanan; William Baumol; [Ronald] Coase, T. Crocker, who I'm not familiar with, but he comes up in a number of cases and studies later on; Al Harberger; and S.V. Ciriacy-Wantrup, who's the outlier from Berkeley. So these are the thinkers who are helping you shape your understanding of environmental policy. Is that a fair thing to say, at least with respect to this paper?

08-00:04:53

Tolley: I think it is. Of course, he was dead. There was A.C. Pigou. I think we talked about this last time.

Burnett: Yes.

08-00:05:00
Tolley: Kind of started the whole thing around the turn of the twentieth century.

Burnett: Right. Yes, there are definitely some ancestors that are invoked.

08-00:05:08
Tolley: Yes. But these were the current people. Tom [Thomas] Crocker was an original thinker and he was very good. I forget even where he was. Anyway. [Thomas Crocker earned his doctorate from the University of Wisconsin. With Canadian economist John Dales, he developed the concept of "cap and trade" for environmental pollutants. He is Professor Emeritus in economics from the University of Wyoming.]

Burnett: So can you set the context? What was wrong with environmental policy circa 1975? What was happening that necessitated a different kind of economic analysis?

08-00:05:53
Tolley: Well, that could take us a long time to think about, even. What was wrong with it? Well, it was too theoretical, starting with Pigou, who brought in externalities and so forth, very fundamental ideas. But then there is a long history of theoretical work on the environment, and it's a rather rich literature, as I recall. But it didn't come to grips with reality at all. It was very beautiful theoretical literature, but that was it. Then —again, I'm free associating — what year was that? Richard Nixon was president, and he said, "I sense that the American people want to do something about the environment." Now, it had actually started about ten years earlier when they set up these air sheds. Like the metropolitan area of Chicago is a natural air shed. They set up governmental mechanisms whereby the local governments could get together and try to pool their common problems and work on them together. It did not work. So Nixon came along, and he said he sensed we needed to do something about this. So that led to the passage of the Clean Air Act, which was in '72 or something like that. [Clean Air Act of 1970 provided for comprehensive federal regulations, but the first federal Clean Air Act was 1963].

Burnett: That's right.

08-00:07:41
Tolley: Then there wasn't any, then how are we going to do this?

Burnett: Right.

08-00:07:50
Tolley: That's what led then to this book. Ed, of course, is a very fine economist, and that's —.

Burnett: Oh, Ed Mills.

08-00:08:02
Tolley: Yeah, Ed Mills, right.

Burnett: Where was he? Was he at Chicago? No, he was at Columbia, at the NBER?

08-00:08:07
Tolley: No, he wasn't; I believe he was at Princeton. He was there, and then he was lured away by a special professorship at Northwestern. I don't remember the years. But anyhow, when he came here — we had known each other — we became very close friends and worked together. I think the Clean Air Act did call for research on how to evaluate these things. A lot of this was driven by research funding. Part of that funding was from the National Science Foundation. There was a person at the National Science Foundation named Larry Tombaugh. Larry had heard me speak somewhere. He became central at the NSF work.

08-00:09:44
Tolley: There were the people at Argonne, the Croke brothers, Ben Croke and Kevin Croke. Ben Croke was the older person. They were very gung-ho on involving the scientists of national labs in the, shall I say, social science. That was controversial. A lot of people at the labs didn't believe in that, and still don't believe in that. But anyhow, they forged ahead and started working with some of the community groups in some of the local watersheds. I guess we had talked; we were in conversation with them. Of course, at that time, until quite recently, actually, Argonne was run by the University of Chicago, and the director was usually a faculty member from here and so forth.

Burnett: There was a natural connection, an institutional connection.

08-00:10:47
Tolley: Yes, right. Then there was Ben Croke, who was probably the more entrepreneurial of the two. Then when he left Argonne — I don't know for what reason — I got to working with Kevin. Kevin, he's still around. We don't want to go into his career, but he was very important in this, and we were able to communicate. Why we were able to communicate, I had had a year of engineering in the Army, and that made it possible. I think Kevin, it was quite clear that the engineering approach — I can't possibly describe it adequately — but it is more of a case-study approach. They start working on a problem, then you set up something highly specific and reason from that. Economists don't do enough of that.

Burnett: Well, I wanted to ask you about common ground between economists, especially in the post-World War II era, and engineers, because it's really interesting that, say, in engineering, you have control optimization, and in economics you have the long hand of operations research. So Milton Friedman and others, and George Stigler, they're doing studies for proximity fuses and they're using sophisticated statistical tools. The ag group folks are using large data sets, some of the largest data sets around, sophisticated tools

of statistical analysis, sophisticated computing. So in other words, who else but you and the folks at Chicago and a few other places, who better to communicate effectively among the social sciences, to engineers? I would ask, isn't there a natural affinity? Or you're saying they had a slightly different orientation and it was a bit harder to find common ground?

08-00:13:29
Tolley: I think for the profession as a whole, it's harder to find that. There in the seventies, when the Clean Air Act was first getting going, there was a lot of enthusiasm — a naïve enthusiasm, if I may say so — that somehow the economists were going to come in and solve this whole thing magically. I remember a conference over here across the Midway at the Center of Continuing Education, and it was — now I'm using the wrong words completely — this typical economics, from the layman's point of view, gobbledygook. These theoretical models with congestion. There was a very famous Japanese economist named Ozawa who was on the staff here.

Burnett: Oh, Hiro Ozawa?

08-00:14:35
Tolley: Yes, he was here. He was giving a talk at a conference. He kept saying *congistion*. Bob Haveman was sitting next to me, and he said, "What is that word?" It was congestion.

Burnett: So they were misunderstanding what he was saying?

08-00:14:57
Tolley: Anyway. Hiro is a brilliant theoretician. But those were not the tools that you needed to solve these problems. Economists are good at that — I'm being critical now — of spinning wonderful complicated stories that most of the time, or often, are not relevant, let's put it that way.

Burnett: You really demand the test of empirical relevance. It has to be connected to what is observed in the world, what can be measured?

08-00:15:35
Tolley: Right.

Burnett: To the extent that there's sophisticated theory in Chicago, the sophistication is around whether or not, or how closely, you capture the phenomenon. That's the metric, that's the guide that you use to determine whether the economics is good or not.

08-00:15:59
Tolley: Yes, that's the true Chicago economist. We all have our views about where things are going these days.

Burnett: Well, I think that the sophistication has become a part of economics in general. Whether or not it's deeply connected to what is going on is a question. But let's save that for our final session.

08-00:16:26
Tolley: Right.

Burnett: So there is this connection between what is happening — the National Science Foundation is sending out feelers to get researchers to pay attention to, how are we going to measure this? How are we going to implement policy? It's quite tricky. One of the things that I was thinking as I was reading the environmental research, having also read your work on fiscal externalities in urban economics, there's a similar kind of problem, in that the phenomenon that you're dealing with is moving out from under policy jurisdictions, right? So, pinning down the phenomenon that is to be captured or controlled or limited is very tricky, and a lot of your policy advice is around that. So for example, in your fiscal externality work, you're looking at the consequences of what would be excessive taxation, defined as: If it's excessive, it means people move away so as not to be taxed. So the policy interest that you have is that you want to discourage that kind of flight. You want to sort of capture your tax base, as it were, and not have a counterproductive policy. Same thing with air pollution. Air pollution spills out between jurisdictions. Do you have a Chicago- or Illinois-based airshed policy? What does that mean when the air pollution comes from Indiana? Then if you have a federal policy, how do you key it so that it's sensitive to variation on the other end of things, right?

08-00:18:40
Tolley: Yes.

Burnett: You can have the same amount of pollution being emitted from a factory, but the experience of the concentration of the pollutants will vary, depending on the wind, depending on where you are, not just within these sorts of concentric circles in proximity to the factory, but there's also topography. There're all kinds of other factors that have to be taken into consideration. So I sense that your encounter with the empirical evidence and your thinking is always considering the complexity of the problem and the degree to which a given policy can capture that phenomenon, can encapsulate it, and act on it properly, right? I think that's the concern overall, if I can just broadly characterize it.

08-00:19:42
Tolley: Yes, right, yes.

Burnett: I kind of see this National Bureau of Economic Research paper as a manifesto. I hadn't really thought of it in that way until now, but you're setting out an agenda and saying that we need a framework for understanding and comparing policy alternatives. Because you've got umpteen studies saying, what happens if you use a catalytic converter? What are the costs of that? But

the useful data are, or the useful analysis is, should we use a catalytic converter or should we use taxation of the automobile industry, or should we use some other policy that involves either a technology or a system of taxation or something else? So you're worried about blunt instruments. I think that seems to be—.

08-00:20:47
Tolley: Well, yeah.

Burnett: So one of the things that starts to emerge in your thinking about this and in your colleagues' thinking about this is you're setting up a range of options from worst to better, let's say. So in your studies, what is the bluntest instrument to use when you're talking about environmental policy? And what are some better alternatives that you discovered in the course of reasoning through this, in the course of investigating the data on environmental policy?

08-00:21:35
Tolley: Right. Well, let me think on that a second. That's a very important question.

Burnett: Sure.

08-00:21:48
Tolley: Well, one of these things was in the implementation of the Clean Air Act. The Clean Air Act took the national point of view, but as your remarks are kind of saying, it's really a local problem. There is, as you, I'm sure, know, a very elaborate mechanism, whereby things start at the federal level, but then it's the federal democracy, presumably, so the implementation is left to the states. Sometimes that's done very bluntly, and other times it isn't. For instance, sometimes there's an air-quality standard set up. That's probably the biggest, or one of the more obvious problems. There's a standard set up, but the environment really is not like that. If you're out in the desert, the benefits of cleaning up the environment are very small, compared to what they are in the middle of Chicago, for instance. So that is one of the biggest things. [beeping] Excuse me.

Burnett: Sure. [break in audio]

08-00:23:13
Tolley: So, applying uniform standards to non-uniform situations is kind of the basic problem.

Burnett: Right. And that can be a problem for the object of intervention, too. So the company size matters. If you have a uniform standard that is costly, it could be absorbed by a giant coal company, but a smaller coal company would have to implement the same technology with the same level of cost. It's the difference between—. The policy, if you follow through with it, you can inadvertently increase corporate concentration, right? Because these smaller companies would presumably go bankrupt, and you would just get greater and

greater concentration. I think I read something about how regulations have been used to increase the concentration, because the smaller companies can't implement the regulations. So some of them go bankrupt, others get merged into larger operations that can afford to make those interventions, and you have this kind of unintended consequence of the regulatory regime.

08-00:24:30
Tolley: Now, this brings us to—was that the nineties?—the amendments to the Clean Air Act. They introduced tradable emissions.

Burnett: I was going to ask you about that.

08-00:24:43
Tolley: Yeah. That had a big effect. And it's exactly that. So a small company can buy its way out by getting a larger company, or other companies, to give up their rights. That has probably had a big effect. But it was a major change in the Clean Air Act. I think it came in in the nineties.

Burnett: That Clean Air Act is 1990. You've stolen my fire. [laughter]

08-00:25:18
Tolley: Sorry about that. [laughs]

Burnett: I was going to get to that.

08-00:25:23
Tolley: Let me go back a little bit.

Burnett: Of course, yeah.

08-00:25:26
Tolley: I'm recalling this conference that I was telling you about in all this beautiful setting, and there were representatives from the National Science Foundation who were not primarily economists. I could see that they realized from that conference, if not before, that the economists were not going to solve this problem. So as I say, there was Larry Tombaugh. He was a forester.

08-00:26:06
Tolley: As I say, I think he eventually became dean of forestry at Michigan. In any case, there were these people at Argonne, and they were building these air pollution dispersion models, Gaussian plume models. There're two kinds of pollution; one is inert and the other is very active. If you have smog, it's very complicated because all the different things intermingle. If you have something like SO_2, it's inert. It's just like throwing a pebble in a pond. so you want to look at it that way. So the people of Argonne were building these air pollution dispersion model — and somehow I knew Larry Tombaugh — and the NSF jointly funded Argonne and the University of Chicago, and we used Chicago as a case study and we began applying all these tools that we're talking about. The fundamental insight in there, interdisciplinary research is

all very well in principle, but it usually doesn't work out because each researcher is reporting to his department head and publishing articles paid attention to by the discipline, rather than focusing on the problem. So the way to get good interdisciplinary research is to get everybody working on the same problem. And that's what we were doing there. I still believe in this very strongly. It's being done more and more, but still not enough. So that's part of the background of all this.

Burnett: Do you think that's related? Because the first thing for a historian of science that comes to mind is the Manhattan Project. It's an exemplar of a successful interdisciplinary project, and it's exactly as you said. They had different problems that were all integrated and overseen. But you had rooms full of physicists, engineers, chemical engineers, you name it, all together working on a set problem. Here we are in Chicago, with Pile No.1 and there's almost an institutional legacy. That's too much to stretch that too far. But I think that you're exactly right. You've pointed to, if you retain the faculty-line silos and the responsibilities to your own profession or your own discipline, without any other considerations, it's bound to fail. But I think that they're trying to do that in knowledge incubators and those kinds of things, to get people to work together, to have a common place to work. Did you have a kind of common place where you would meet to do that kind of research? Would you go to Argonne, for example, and have meetings there with everybody in the same room? How would it work physically?

08-00:29:36
Tolley: I don't think the big team, the total teams, ever met. So no, we would meet in restaurants for lunch.

Burnett: That's great. But the sub-teams, were there sub-teams that were working on components of the larger research project?

08-00:29:59
Tolley: There were, but they were not big teams, so the individual researchers would get together. There was not a big conference or sub-conference, just individuals getting together. There were certain key individuals.

Burnett: But you were putting the project, if you're talking about RACT2 or—. It could be the solid waste project or whatever. You're kind of assembling things, aren't you?

08-00:30:36
Tolley: Yes.

Burnett: So there's a project-management feature to this.

08-00:30:41
Tolley: There is. Physically, as I say, literally, I remember, It's the restaurant right over here at 57th and Dorchester.

Burnett: Is it still going, this restaurant?

08-00:30:58
Tolley: Yes. I'm blocking on the name. Anyhow, Kevin and I and the group, I remember many, many lunches there. This is only partly apropos. There was a — this was not me, this was the Manhattan Project — there was a drugstore, Steinway's Drug store. There's a restaurant there now. That's at 57th and Kenwood. But anyhow, [Enrico] Fermi and three or four others were sitting around the table there. They were there all afternoon. The proprietor came around and said, "I'm sorry, you'll have to leave." He was interfering with—

Burnett: With the operations of their business.

08-00:31:43
Tolley: Yes, right.

Burnett: They didn't buy enough pie, I guess.

08-00:31:46
Tolley: Exactly.

Burnett: So there's a context in which the federal government research arms and the federal agencies that are somewhat local to Chicago, are involved in helping the EPA and other like institutions to figure out what to do about the implementation of environmental policy. One of the other features, too, that was mentioned in the air quality volume, and is confirmed by the interviews I've done with folks in the mining industry, is that the initial Environmental Protection Act in 1970, the Clean Water Act and so on, and all those acts in the early seventies, the initial requirements were actually quite limited. But then they get a lot more stringent progressively, until the late seventies. So by 1977, some of the restrictions on pollutants in the air, for example, are up to twenty times what they were in 1970. So I imagine from the industrial side of things, there's a bit of a panic: "How are we going to meet these? Their restrictions keep going up and up every year. These are unsustainable." It's kind of reminiscent of the panic in the lead-up to the Trump election. There was a lot of industry organization around these, "unsustainable" Obama restrictions on coal, for example. But there was a real panic. And to some degree, it was legitimate. If it was enforced immediately, there were a lot of serious economic consequences for those industries. So you can see why there was a certain amount of action and apprehension about how to do this, and an effort to work out a workable set of alternatives. So instead of a blanket uniform policy, how about some other approaches? I think that might be a good opportunity, then, to talk about the second volume that comes out. Because we've already discussed *Environmental Policy Volume 1*, which does set up the framework that you're talking about for analyzing environmental policy. We talked about that in session five. But *Air Quality* is out in '82, with Ballinger, and it's you and Philip Graves and Alan S. Cohen. We haven't talked about Alan Cohen; we've talked a little bit about Philip Graves. Can

you talk about those two in the context of this work? You've collaborated with Philip Graves on a number of projects and volumes. Can you talk about him as a scholar and a colleague?

08-00:34:59
Tolley: Right. Well, Phil Graves and Glenn Blomquist, I hired them both over the telephone, I must have been in the [US Department of the] Treasury. I know Glenn was in the military out on the West Coast, and Phil was finishing up his PhD at Northwestern. Anyhow, they were economists, and they came and I worked very closely with them over the years. Al Cohen was the Argonne representative. He was the successor to Ed Croke, and he was, I guess, the principal PI [principal investigator] out there for quite a while. Then he took a job in Boston, and that's when Kevin Croke, Ed's brother, came into it. Kevin and I have been very compatible, worked together a lot. But Kevin is an engineer.

[bell rings]

Burnett: [interview interruption] So we were talking about the *Air Quality* volume. Now, in terms of the work and the volumes in general, did you map all of this out? By the time you had *Environmental Policy*, that the series was conceived and that there was a contract with Ballinger to put out five volumes, was that already understood?

08-00:36:35
Tolley: It probably was. But it was the system that we'd evolved during the seventies in this. We were just putting them down for the record, really, is what we were doing.

Burnett: Yeah, that explains why they come out one year after the other, basically, from '81 to '87.

08-00:36:58
Tolley: Right.

Burnett: Yeah. I was wondering how all that work was done. But it really is just documenting this work from the 1970s, ten years of work, really.

08-00:37:09
Tolley: I think so. There was a transition. There was the NSF work for several years, and then I went into a series of rather large grants from the EPA. I think there is a provision, is or was a provision, in the federal law that you had to estimate the economic benefits or something like that. So there was a series of — I supported Phil and Glenn and many other people through grants. This was drawing on those results.

Burnett: Near the end of this volume, there's this set of conclusions. One of the claims is that direct regulation is not the way to go, if you can avoid it. It's often

inflexible, it's very expensive, and it often has negligible benefits. I don't know, I'm sure some of them have significant benefit, but there are some of them, it's not clear what the benefits are, and then the difficulty and cost of monitoring these kinds of policies. One of the things that's mentioned here is that salable emissions rights would be better. I wanted to ask you about that. In this explanation, the salable emissions rights are a better way than direct regulation of air pollution, because the changing valuations around it are automatically built in. So can you talk about the difference? Talk about what's problematic. We've said something already about how a blanket requirement does not respect the variation in the size of firms; it doesn't respect the variation in the effect of the pollutant through space or across different weather conditions and that kind of thing. So it doesn't encompass these variations. What's better about salable emissions rights, and how does that work?

08-00:40:07

Tolley: It's economic. You get the control where its benefits are the greatest, and you don't impose controls that are needless, because it's impossible — as the communist countries did — it's impossible to wreck the whole thing by—. There is an invisible hand; there's no such thing as the non-invisible hand. Something like that. But it gets the controls to where they're most needed and gets them out of the places where they're not. There's a grandfathering period: You were emitting these emissions at a certain point in the past, so that's your quota. So everybody has a quota.

Burnett: So is it that there's a kind of budget. You're given a kind of budget, if you're a polluting industry, or a firm, let's say, and you're given a kind of budget, and they say, that's your target. How you meet that target is up to you, and you can purchase a kind of reduction in emissions. Because you can't—. Let's say your business is growing and you're going to end up polluting more. So that marginal increase in your pollution, you can purchase that from a non-polluting other industry, and they can sell you that. It creates a market, a cap and trade market.

08-00:42:10

Tolley: Yes, that's what we're talking about, cap and trade, actually.

Burnett: Okay. So this is the early ancestor of all cap and trade.

08-00:42:20

Tolley: Well, that's right. I'm glad to be reminded that we recommended that.

Burnett: You'd forgotten that you invented cap and trade? [laughs]

08-00:42:30

Tolley: Somehow. [laughs]

Burnett: So I started tracing this through. There's probably earlier versions of these kinds of games, let's say; but in terms of policy prescription, I couldn't find anything much earlier. It shows up later. The Clean Air Act amendment of 1990 is the first, because they have the Acid Rain Program.

08-00:42:59
Tolley: That's what I'm talking about.

Burnett: Okay. So the Acid Rain Program is the first kind of workable example of a cap-and-trade market.

08-00:43:07
Tolley: Right.

Burnett: There is a tremendous discursive explosion around cap and trade policy through the late 1980s and into the nineties. It's not adopted in Europe. The experimental version of it is in the UK, in the late nineties, and then it doesn't become EU policy. They have the largest cap-and-trade market in the world; but it doesn't get EU-wide until the mid-2000s. So now, there're all manner of cap-and-trade systems in the world.

08-00:43:56
Tolley: Right.

Burnett: I was reading about "saleable emissions rights," and I was thinking, that sounds like cap and trade. Is that cap and trade?

08-00:44:09
Tolley: Yes, it is.

Burnett: Okay. I just wanted to ask you about that. Did it seem like when you were working this out with others, did you have a sense—? Was this your idea? Did it come out of the group discussions about it? Is it something you had read somewhere and you adapted it? How did that idea get put down? Is it something that was being talked about in the seventies, as part of the Argonne and NSF work?

08-00:44:49
Tolley: I don't recall. It flows so naturally out of everything that. I forget how we put it. We could've just thought, it's a natural idea; we better put it there. But it may be pie in the sky, because people are never accepting economists' recommendations for this kind of thing.

Burnett: Well, you can see it as a way to kind of break a deadlock, policy-wise, because as you can see from that time period, the EPA requirements were interdictions, zero this and zero that.

08-00:45:42
Tolley: Right.

Burnett: The industry representatives were thinking that this was ridiculous: "No, we can't do that, unless you just want us to stop operating." So this working out of thresholds was an important part of the process. The second part of it, as you said, is a way of getting around some of the unique problems that have to do with a blanket approach to things, where a smaller firm would not be able to afford and a polluting firm would not be able to decrease emissions without decreasing growth. So taking into account the dispersal, the variance in effects from pollutions, you could have a system where the total emissions are reduced overall and the costs are kind of traded way. You're kind of taxing polluters, in a way, by forcing them to purchase the right to pollute, at a cost that's marginally below the profits they're making from the increased growth, right? So that's essentially how that works. There is a revenue stream from selling these rights from others who don't pollute, and then you're incentivizing the greening of other operations. It has these kinds of interesting effects, where you're using the price system — and that sounds like classic Chicago economics.

08-00:47:27
Tolley: Yes.

Burnett: Let prices dictate how we move environmental costs and benefits around, and have a total reduction in environmental pollution and an increased benefit for the maximum number of people. So this kind of Chicago utilitarianism at work, I suppose, is a way of thinking about it.

08-00:47:50
Tolley: Well, I hope we originated it. By this time, by the eighties, there's a whole slew of environmental economists working on this. So I think we were not alone in being in favor of this kind of thing, by that time.

Burnett: Were there other centers of this kind of work? We talked earlier about the ways in which public policy schools were beginning to spring up at this time, and that Chicago was a bit late to the game. You were the public policy group, but you weren't official. You were situated in different departments and doing this work.

08-00:48:34
Tolley: Right.

Burnett: So the other institutions — Harvard and Berkeley and Caltech and Princeton — did they have public policy [schools]? I think public administration has long been part of Yale and Princeton's school system. So did you have a kind of thought collective that went beyond this immediate group, that was at other institutions? Were there people you could name, or institutions that were moving in parallel to what was happening in Chicago?

08-00:49:17
Tolley: Well, one major part of the story comes back to agricultural economics. The agricultural sector was rapidly declining, and a lot of the ag economics departments, should we say, were looking for things to do. Berkeley was one of the major ones, the University of Maryland. There are several places. In general, the ag economists have led the way. Of course, they're empirically oriented and so forth. So a lot of it has come from there. A lot of it has come from just economists in isolated departments of economics getting interested in the environment and having a mandate to teach in that area, increasingly.

Burnett: That's really interesting. So I can actually pinpoint that. The College of Agriculture at Berkeley becomes the College of Agriculture and Natural Resources in 1978.

08-00:50:26
Tolley: I see. Okay.

Burnett: Originally, Berkeley had its College of Agriculture for all of California. Davis became the super center for ag in the UC system, and then Riverside a bit later, as well. So Berkeley had lost its ag college, or its experiment station was now urbanized. So they married it with the Natural Reserve System. They had a set of ecosystems that they'd purchase land, swamp areas and mountain areas all over California. So it combined environmental study, conservation biology, and College of Agriculture, to think about some of these larger concepts. And who is there but S.V. Ciriacy-Wantrup?

08-00:51:35
Tolley: Yes, I know.

Burnett: So your old friend and colleague that you had worked with. I guess you were there in '70, '71.

08-00:51:43
Tolley: Right.

Burnett: There are other reasons why it becomes what it becomes, but that becomes a center for the formal academic study of natural resource use, right?

08-00:51:58
Tolley: Right.

Burnett: So environmental economics now has a strong home there. Similar institutional changes are taking place in the seventies and eighties, to make room for that.

08-00:52:15
Tolley: There's also RFF, Resources for the Future.

Burnett: Yes.

08-00:52:20
Tolley: That was very important in all this. Still is important.

Burnett: Yes, we did talk about that in earlier sessions. So Resources for the Future is really central to this story, as well. One of the things that's coming out of this environmental work is health studies, looking at the effects of pollution on mortality and morbidity. This has a long history. There was that London fog, the smog of 1954 that killed 6,000 people in a matter of days. People became very acutely aware of the health costs and the life costs of pollution of different kinds. So there's almost an actuarial science that grows up around this, around the issue of mortality and morbidity, which I had always assumed was really already highly developed by the actuarial sciences, right? That the insurance companies had a really strong interest in elaborating the cost of being injured or the cost of losing a loved one who's insured, and that a dollar value is placed on that. But in terms of policy, it's taboo because the cost of human life is supposed to be—

08-00:54:04
Tolley: Infinite, right.

Burnett: —priceless, right? Absolutely. So I wanted to ask you, then, at this time, is human life an externality?

08-00:54:21
Tolley: Well, I think the disease effects of the environment are an externality. People are going to die anyhow, but when we have excess deaths due to the environment, then that's an externality; no question about it.

Burnett: And you have to cost it out.

08-00:54:42
Tolley: Yes, right. So a lot of our effort and a lot of my efforts were devoted to this, of course. The value of human life, that's part of the book that we were talking about. But it grows right out of that. I think that a lot of our work on that, going into a methodology, there's something called contingent valuation. We were dragged, kicking and screaming, into that. Most economists, or many economists, don't approve of it. They say, well, if you ask people, they never tell you the right thing.

Burnett: They're unreliable sources.

08-00:55:32
Tolley: Yes, that's right.

Burnett: Surveys.

08-00:55:36
Tolley: I was willing to go into it because having had years and years of experience in interpreting regression coefficients, I knew how easy it is to get misled by

them, unless you're—. Even if you're very careful, you may be misled because there's multi-collinearity, all the rest of it, imperfect measurement of variables and so forth. So my attitude was and is, we need all the sorts of information we can get. If you're careful in setting up these experiments, you can learn an awful lot of from them. A lot of that is at the heart of this book on valuing health for policy [*Valuing Health for Policy: An Economic Approach*], which is about that.

Burnett: Right. So the environmental studies lead to this kind of actuarial work. There's Glenn Blomquist's seatbelt study from 1976, right?

08-00:56:48
Tolley: Right.

Burnett: Which deals with some of that. You can see it percolating up in the research community that you're surrounded by.

08-00:57:00
Tolley: There's epidemiology. Really, the economists have gotten in bed with those people, because they are very much concerned with that when they're trying to predict what is going to happen to health. They run very sophisticated statistical studies now.

Burnett: Oh, absolutely. This is the thing. It's addressed in a forthright manner in the beginnings and ends of the volume that we're going to be talking about that's into the 1990s, *Valuing Health Policy*. That is, this kind of aversion to quantifying or monetizing aspects of human life that have been considered to be so priceless. But you can see the drivers — and you mention them — but the drivers that are pushing more of an economic conception of health in advanced industrial societies. So there was always a cost to health, but it was kind of consigned to these non-economic domains. You had charitable giving that would have religious orders and hospitals that would be funded by patrons, and it was kind of outside of the economy.

08-00:58:42
Tolley: Right.

Burnett: County hospitals, things like that. As things become federal and national and you have national health systems, you realize the enormous cost of it, and that the costs are growing as you encompass and bring more and more people into the fold. So in the US case, you have Medicare and Medicaid in 1965. The financial consequences of Medicare are not immediately apparent, but by the mid-1970s, the combination of Medicare enrollment of sick populations, the Vietnam War, and stagflation and OPEC — right at that moment is when you were all doing these studies on morbidity and mortality. There're the beginnings of a conception of a need to evaluate health in different ways, because it is apparently costing more. I don't want to offer that as a definition; you're free to disagree with that historical framework. But I imagine that that

has to be part of the equation, as we move from the 1970s into the 1980s and nineties. Healthcare keeps getting more expensive, populations are aging, technology is more expensive, hospital care is more expensive, pharmaceuticals are more expensive, the research regimes at the National Institutes of Health. So taxes are going up to pay for healthcare, private insurance costs are going up. Is that a driver behind the origin of health economics?

08-01:00:31

Tolley: It may well be. I haven't thought about it in those terms. For me as an economist, it doesn't take more than a few minutes to realize that valuing human life and valuing health is a terribly important part of the whole problem. I am not trying to be a policy analyst, the way that you're doing, which is fine. Probably is true.

Burnett: But why not in the Great Depression? Why not immediately after World War II? Why didn't we have health economics, let's say, in 1910, with the Flexner Report? The timing of it is interesting, when there is the ascendance of a movement around fiscal austerity and responsibility, accountability — the Reagan Revolution, let's say — increasing costs of healthcare, and a policy eye to managing costs and figuring out new institutional innovations that will manage those costs. I don't imagine that you were a part of that conception, because it's political; you don't see yourself that way. You're an economist; you're a social scientist, first and foremost. So when there's a problem that you're confronted with, you latch onto it. For your part, it seems like it came into your view when you were doing the environmental work. You saw that in order to get a sense of the damage that an environmental pollutant will have, we have to understand how that pollutant impacts the health of a population. Then you've got population studies, you've got a kind of epidemiology, where there's a disease agent, SO_2, for example. So I get that that's why you would see it at that time. But I'm trying, then, to account for why this gets then taken up, probably more than just about anything that you've done. I don't know if that's fair to say, but in terms of citations, in terms of the reception of the economics profession and the subdiscipline of health economics, *Valuing Health Policy* is one of the ten key texts for understanding health economics, period. So this is an important component of your legacy. I suggest that it has to do with the timing of your investigations dovetailing with this perceived need to really understand the cost of health, and to understand it on as full a basis as possible, to be as expansive about it as possible, because it's figuring more and more into the accounting of any government today.

08-01:04:01

Tolley: I accept that.

Burnett: Okay. I've sold you on it, then. Perfect. We'll see if history accepts it. That might be another challenge. So let's put a small pin in that for the moment, and just continue talking about the Ballinger series just for a moment. We did

a little deep dive into *Air Quality*, this Volume 2, that came out in 1982, with Philip Graves and Alan S. Cohen. Then there's a volume the following year called *Water*, and it's about water quality and environmental policy that's relevant. And a Volume 4. It comes out in '84, '85, called *Solid Waste*s, which is with you and Joe Havlicek.

08-01:05:14
Tolley: Right.

Burnett: And Volume 5 is *Recreation and Aesthetics*, with Roger Vaughan. Do you have a word to say about those volumes? It's capturing the research that you were doing in the seventies. Were they project leads? Glenn Blomquist and Daniel Yaron, were they really orchestrating the water project? What was your recollection of those volumes that came out in the eighties?

08-01:05:50
Tolley: A good point. As I say, a lot of this came out of, actually, EPA work. Of course, clean water became a policy concern. The recreation had been there, really, all along. You were talking about [Harold] Hotelling. Hotelling originated a lot of things, but he had—. Are you familiar with the work? What's the value of a national park? So he began, based on the travel costs that people were willing to bear. If they were close, they would go more frequently than if they were far away. So he said on that basis, you can derive a demand curve for the park. And then are you in the consumer surplus? Anyhow, then you use the demand curve and you get the surplus, and that's the value of the park. So he had that idea. Was that back in the twenties or somewhere? [Ed. note: *The Economics of Public Recreation: An Economic Study of the Monetary Evaluation of Recreation in the National Parks*. Washington, D.C.: Land and Recreational Planning Division, National Park Service, 1949]. Anyhow, it was a very, very important idea, and people kept doing that. I started studying parks. I think it must've been—I don't know why—it must've been in Raleigh. That was one of the early interests in all of this. Of course, there's a whole discipline about this these days. So that's kind of where that came from. Frankly, I forget what our applications were in the *Recreation* volume.

Burnett: Well, I can only say that what begins to happen is that you actually have private tourist industries around the valuation of natural spaces close to national parks, or using the natural beauty as a kind of tourist asset. So Colorado comes to mind. You actually have cases where ski runs, ski resorts, are battling with mining companies over whether or not you get to strip-mine up the mountain that's within view. And they have to negotiate. You end up putting price tags on these kinds of things because that ends up being an important economic driver. People do value recreation, they do value health and the salutary effects of the outdoors, and they're willing to pay for it. That becomes an important part of any sort of modern economic rationale for a state. So the courts get involved and you need to actually have benefit-cost

analysis for that kind of work, how you value the view of something. What are the benefits of that and what are the costs of not having that view? So that's an interesting feature of that kind of research.

I assume that the *Solid Waste* volume was with Joe Havlicek. Can you can about Joe Havlicek and—? Well, Roger Vaughan is for the *Recreation and Aesthetics.* Are these all students of yours, or colleagues?

08-01:09:38

Tolley: No. Let's see. Joe Havlicek came out of the TVA again. Or was Joe at NC State? [Havlicek taught at Purdue University and Virginia Polytechnic Institute from the 1960s to the 1980s. He died in 1993] Anyhow, he came out of that, and he was very active in the TVA. I did a lot of work with TVA when I was at NC State. So he was a friend and a colleague. He eventually, then, came to Purdue. He became president of their association and all that. A very outstanding guy. We were interested in solid waste together. Did we have funding for that? We must have. I don't remember all the details. But Joe and I went, with other people, around to visit all these landfills and we were interested in the fact that nobody had viewed solid waste as something to be an object of objective inquiry. So we were very interested in it. I remember we wrote an article once, probably in the *Farm Economics* journal. Anyway, we said, "Solid Waste, a Resource?," question mark. Anyhow, we were talking about solid waste as an economic commodity. So Joe was that way. The other person was—?

Burnett: With *Recreation and Aesthetics*, it was Roger Vaughan.

08-01:11:23

Tolley: Yes, well, he was a student here, at U. of C. [Chicago].

Burnett: Oh, okay.

08-01:11:27

Tolley: He was very interested in that. He did his thesis on some technical things in that.

Burnett: With *Water*, it was Glenn Blomquist again, and Dan Yaron, or [changes pronunciation] Yaron.

08-01:11:42

Tolley: Yeah, Dan Yaron. So Dan was from Israel. I forget how he —. He was a postdoc here for a while. There were a series of postdocs, three or four, from Israel, and he was one of those. I forget how I came in contact with Dan.

Burnett: You had a number of students from China in the 1980s. I counted six from China and three from Korea. Can you talk about how that came about? Is it that you were interested in the work on China, or was there a Chicago connection between China and Chicago, and Chicago was attracting students

because of you, because of D. Gale [Johnson], because of Ted Schultz? Was there a kind of ag group connection to China?

08-01:12:47
Tolley: There probably was, but I was not particularly aware of it. Because of my involvement in the ag workshop, I got to know those Chinese students, and worked on several of those committees and so forth. There probably was such, I'm sure. D. Gale clearly had very close connections, to the end, with China. With Korea, it might've been more me, because I went to Korea beginning in 1970, and kept going back. The guy who was my translator ended up at the University of Chicago and so forth.

Burnett: Oh, cool.

08-01:13:38
Tolley: Yes.

Burnett: Great. Did you ever get a sense of your place in the impact on Korean agricultural price policy, for example? Would you say that you transformed that? Or were you one of several advisors that was shaping policy there, with respect to agricultural prices?

08-01:14:09
Tolley: That's a very good question. There was a period of about a year when I was the world's leading expert on the price of rice internationally, because I had to get into all of that. But then I moved onto other things. As I say, I sense that I had a great deal of influence, at least on the academic side of the Korean, but also the civil service side. They seemed to be very impressed by these presentations I would give on why the price of rice is doing this. It opened up their eyes to things that they hadn't seen before.

Burnett: And you note later, in a subsequent publication, that their goal was agricultural self-sufficiency; but they achieved that and they were in the process of moving to a more American-style agricultural pricing policy that was working for that, and that had worked for them overall. So a combination of your influence and their ingenuity and achievement. Those are the basic contours of the 1980s. There's one more piece of it that begins in 1984. The work for the Energy Engineering Board—1984 to 1990—was that something of deep involvement, or was it a bit more of an extension of work you were mostly doing elsewhere?

08-01:16:06
Tolley: Probably an extension. Did we go into it?

Burnett: I don't know anything about it, except that it's a line on your CV, and I was just curious about it.

08-01:16:16
Tolley: I see.

Burnett: I don't think there are any publications that are associated with it. But as we know, board memberships can be somewhat pro forma. But it has to do with your research on energy. Now, that is a story, really, for the nineties and the 2000s, I think. But I was wondering if the seed was planted there, because of the work that you were doing for RCF Consulting.

08-01:16:47
Tolley: Now, was that the National Research Council?

Burnett: Yes.

08-01:16:50
Tolley: Yeah. Yes, I served on those boards for a while. Often, I was the captive economist.

Burnett: Okay. [laughter]

08-01:17:02
Tolley: Which was very good. But it was that way. You meet every few months and, well, we have not mentioned the name of Gilbert. Do you know Gilbert White? He was a very famous geographer. Gilbert, he was head of geography here.

Burnett: At University of Chicago?

08-01:17:31
Tolley: Yes, and he took an interest in me. I had a lot of interaction with him. I think he got me involved in that. But I remember a line I wrote for the Energy Engineering Board. It was a lot about water, actually. I said something, "There's no more reason for having a research project or a project to develop water in Arizona than in New York City." They liked that quote very much. So Gilbert White was important in involving me in this thing, as was RFF. I had a lot to do with RFF [Resources for the Future].

Burnett: So your relationship with RFF continues throughout the decades, basically?

08-01:18:33
Tolley: Well, yes. Mainly, at that point, and I think RFF still lives off of Washington grants. RFF didn't really fund me. But from the beginning, they have had very good economics.

Burnett: That's actually worth outlining perhaps once again; another distinguishing feature of the ag group. Much is made about Chicago economists and their paraprofessional or professional connections with think tanks. Even Theodore Schultz was a key member of the Committee for Economic Development and the National Planning Association. But there were these other organizations that begin to sprout up in the sixties and seventies and eighties—the Heritage Foundation and so on—which have an explicitly conservative policy orientation. American Enterprise Institute is more between the Committee for

Economic Development and, say, Heritage. It's a bit more conservative, but it understands itself as providing objective research and so on. So a number of Chicago economists were involved in these privately funded think tanks. But I think what's characteristic of the ag group is that they most often sought out, or were sought out by, state funding agencies. I wonder if you could comment on that. So Theodore Schultz, D. Gale Johnson, you, even Al Harberger, were getting funding from Ford, from the National Science Foundation, and you really explicitly more from the National Science Foundation and others, and even state and municipal funding agencies. Is that another kind of organic feature of the ag group, because it emerges out of the state system and is answering to the needs of the public as ag economists? Is that a feature of the ag group, that they see themselves, when they do consulting, they're doing it for state agencies with an eye to making market-oriented policy research and advice for the state?

08-01:21:41

Tolley: Well, it's a feature; but my personal feeling is it's not that major a consideration. But it could just be me, I don't know.

Burnett: I wouldn't suggest that you got up in the morning and said, "I need to go find some funding from the NSF;" it's more subtle than that, and that the driver of it is that you're public-minded in your market-research orientation. It sounds paradoxical; but that was always true of Theodore Schultz. I don't think he felt that a completely laissez-faire economy was either desirable or possible, and that he was deeply interested in harmonizing the public and the private. I think that he's right on that edge between public engagement with a market society. How do you feel about that characterization? Is that true? If it's true or not, does that characterization also apply to you?

08-01:23:15

Tolley: Well, I think it applies to me. Let's see. My father was very active in the CED and all of that, and he was always coming to Chicago to meet with the CED group. I saw a lot of him because I was here then. I suppose that, well, again, my father had been a New Deal figure, of course, and he was not a conservative, an ideologue at all. He and Ted Schultz were very close, it's pretty clear. So I remember when—. When was the big change? [Dwight D.] Eisenhower was the first Republican after the Depression.

Burnett: After the Great Depression?

08-01:24:13

Tolley: Isn't that right?

Burnett: Yes.

08-01:24:18

Tolley: So I was on the staff here, and of course, I think we've all changed in our political views. I was certainly, at that time, a young liberal, coming from this

New Deal family and all that. I remember walking back from lunch, from the Quad Club, with Ted. I was kind of grousing about this election, and Ted said, "Well, let's see what they can do with this." He had a much more open mind. He also then became a big fan of Milton Friedman. I think his views probably changed over the years.

Burnett: Oh, without question.

08-01:25:05
Tolley: Yes.

Burnett: Yeah, I think the country, too. The difference between a Republican and a Democrat. When it came to professional, technically oriented folks who were advising the government, I think it was very much a common, for the CED, I would call them Rockefeller Republicans before the fact, maybe. And maybe Ted Schultz would've been a Rockefeller Republican.

08-01:25:40
Tolley: Yeah, maybe.

Burnett: But by 1983, his work on public education, it sounds like Milton Friedman. His voucher systems and all that. That's very different. So he was persuaded by Milton Friedman, I think.

08-01:25:59
Tolley: Yes, I agree, certainly.

Burnett: Very profoundly. Had a profound influence on him, which is significant and something I, as a historian, am wrestling with, because I see Ted Schultz as the ultimate influencer. He walked into a room and people listened and turned their heads and paid attention, and would reframe whatever they were thinking about in the terms that he had laid out. As someone who has never met him, I feel like I've been spending a lot of time with this person, through his writings and private notes. He certainly had that influence in the Chicago group. But he hired Milton Friedman. He saw something in him that was very impressive. I'm not sure he would've agreed with—. I don't think Milton Friedman was very—I may be wrong about this, but—I don't think he was very strident or very vocal in the 1940s and fifties. There's the *Chicago Roundtable*. Remember that radio show?

08-01:27:11
Tolley: Oh, yeah. My father was on that.

Burnett: Right. Of course he was, yeah. The *University of Chicago Roundtable*, which was an NBC broadcast every Sunday.

08-01:27:20
Tolley: Right.

Burnett: It was often hosted by Ted Schultz, and he would have guests, and he had Milton Friedman. One of the things that they talked about, in 1947, they talked about the need for human capital. So even back then, they were thinking together about these kinds of things. But there is a shift, without question, in him, and probably more dramatic for him than, I think, for you, in your evolution of your thinking. But I don't know. I get the impression from you that you don't see that your social science is to be deployed, with your blessing, for any particular policy outcome. You almost have a kind of civil-service ethos.

08-01:28:25
Tolley: Well, I think in some sense, I have said that often. I thought a lot of my function here was to train people who could upgrade the quality of our government by going back and having a first-rate analysis going in. I certainly think that's true. Did we go over the fact — we must've gone over that — how Milton was certainly not bashful in departmental meetings and so forth, and with students. I took his courses, and he was certainly conservative, to say the least, in that.

Burnett: May I ask you about that?

08-01:29:14
Tolley: Yeah.

Burnett: Did that strike people? Or would you say that the Chicago environment was just already shaped by that, that there were a number of conservative-minded economists? Were there older-guard folks who felt like, you just don't do that? You don't give kind of, those are value judgments, and here, we are social scientists. Was there a positivist backlash or reticence around his arguably strident statements at certain points?

08-01:29:58
Tolley: There probably was. He was very charismatic. Did we go through this? The Cowles Commission was the jewel in the crown here. He came in here and began attracting their students away. Pretty soon, Koopmans and those other people went to the East Coast.

Burnett: That was their reaction? But was it solely because of Milton Friedman?

08-01:30:26
Tolley: Well, I think a lot of it was. Then there was—the background was quite different—. Who was that very famous Polish economist, who went back to Poland?

Burnett: [Oskar] Lange.

08-01:30:39
Tolley: Yeah, Oskar.

Burnett: Oskar Lange, yeah.

08-01:30:41
Tolley: See, he was a complete leftist.

Burnett: Oh, totally, yeah.

08-01:30:43
Tolley: Yeah. I think he left before Milton came here. But I think probably Milton is the reason that Chicago, more in the sixties or later, came to be responsible for viewing Chicago as a bastion of conservatism.

Burnett: I think there was an article in *Forbes* in 1945—I keep getting that date wrong; it's either '45 or '49, but anyway, just postwar—where it's written that Chicago is considered by many to be the last bastion of conservatism. So that's before Milton Friedman is hired. But there were left-of-center people. I think [Paul] Douglas wasn't super conservative, right?

08-01:31:44
Tolley: Well, no, he was liberal, I'm sure.

Burnett: Right. But there was a much bigger range of political opinion in economics, I think, at that time. Let me put it this way. There was a lot more up for grabs, in terms of the economics one could do and the conclusions one could draw from economic policy. There were different schools, even within the United States — institutional economics and then there were all kinds of new tools of statistical analysis and new theory. It was an absolute cauldron of intellectual activity. But you're saying that the arrival of Milton Friedman created a kind of center of gravity, as he began to articulate his views, initially within the department. Fairly soon after, he was a public intellectual that emerged at a time when you had John Kenneth Galbraith. The public intellectual space was East-Coast-centered; it was liberal, left liberal. Milton Friedman emerges in that period to offer an alternative, as the Goldwater conservativism really bubbles up in the 1960s, late fifties, early sixties. So that's part of Chicago's legacy, for certain. Then as he begins to attract students, they are persuaded by his politics, as well as the economics that he has to offer. Is that something you witnessed, as well?

08-01:33:50
Tolley: Definitely. Oz [Oswald H.] Brownlee went to Minneapolis, so there was a vacancy among the three ag economists. Ted offered me that position. Then he said, "What would you like to teach? You need to teach three courses. One will be graduate ag economics, the other was undergraduate. What's the third course you'd like?" So I immediately said, of course, "Macroeconomics." That was the big thing. So I ended up teaching the macroeconomics course. But at that time, then, the department had gotten hung up and they could not agree on a person to represent the Keynesian point of view.

Burnett: Meaning no one wanted to do it?

08-01:34:45
Tolley: No, they couldn't agree on an outside, major figure.

Burnett: Oh, right.

08-01:34:51
Tolley: They couldn't agree on anybody. Did we talk about Abba Lerner?

Burnett: I think Lester Telser has talked about him, yes. So he was considered?

08-01:35:03
Tolley: I think so. Then Milton and Abba had a couple of wonderful debates, which were wonderful for graduate students to hear. But anyhow, Abba didn't— I lived in this student co-op. I was eating dinner there, and pretty soon Abba Lerner walks in and goes back to the kitchen, and he's dating this girl, very attractive girl. Anyhow, that a story about Abba Lerner.

Burnett: It's pre-#Me Too, I suppose.

08-01:35:42
Tolley: That's right. Anyway, I was teaching the macroeconomics and there wasn't anybody else, so I represented the Keynesian point of view. At that point, the students were all Keynesians. So I was the faculty, if you will, against Milton. Did we go into all this?

Burnett: You talked about it a little bit. But the end result was that the students—? Did you get a sense that the students were more persuaded by Milton Friedman, or initially, they were not?

08-01:36:32
Tolley: I don't think they were. Again, I don't know if we went into this. Being empirically oriented, I asked, "Is the quantity theory of money true?" So I said to the class, "Let's get out this data from around the world and see if it's true." So we plotted on a long paper, the log of national income against the log of money. And beautiful straight lines. So we brought the results together and the students asked me, "Well, is the quantity theory of money true?" And I said, "We just have to conclude that it's true, the evidence is so strong."

Burnett: Do you remember what year that was, roughly?

08-01:37:17
Tolley: Well, it would've been in the early fifties.

Burnett: Early 1950s.

08-01:37:20
Tolley: Yeah, probably. Oh, '54 or '55, probably.

Burnett: Right.

08-01:37:25
Tolley: So the students were very disappointed to hear me say that. But I couldn't say anything else.

Burnett: And then it's a couple years later that you write your paper, the one that ends up having an influence [on Milton Friedman], doesn't it?

08-01:37:38
Tolley: Yes.

Burnett: We did talk about that a little bit, "Providing for the Growth of the Money Supply."

08-01:37:44
Tolley: Right.

Burnett: I guess Milton Friedman told you that it influenced him. But wasn't there an independent confirmation that he—?

08-01:37:58
Tolley: Well, let's see. My insight was that requiring banks to hold reserves with the Federal Reserve System was equivalent to taxing money. That was what impressed Milton, and he wrote this book and credited me fully with that. Then John Conlon just happens to be a friend of mine with whom I worked on certain things. I'm not sure he was even a student. But in any case, he said that ten years later, Milton Friedman came out with his theory of the optimal quantity of money. The optimal quantity money, of course, would be where you do not tax the creation of money. So John is saying that I'm really the originator of that idea, so I'm just quoting him. I want to say one other thing then. When I came back to Chicago—. When did Goldwater run?

Burnett: '64.

08-01:39:02
Tolley: I must've been back to Chicago by that time. In any case, I said that the faculty lunches were very important. We were at lunch one day and I said, "Don't you think—?" Is it Howard Henry Baker? Do you know who that is? He was a liberal Republican. He was eventually important in Watergate. Anyhow, I said, "Don't you think he would be a good Republican candidate?" Milton pounded his fist. "What's wrong with Goldwater?"

Burnett: I think you did mention that, but that's interesting. Well, I think Jennifer Burns is coming out with a comprehensive biography, if she's not done already. She's from Stanford, and she's doing a really comprehensive biography of Milton Friedman, so both of us will await that with anticipation.

08-01:40:00
Tolley: Yes.

Burnett: We'll get all of those details.

08-01:40:06
Tolley: Since we're on this. Milton, in the first place, we were on the money committee, the money prelim committee, together. He was representing one view and I was representing the other. But he was very fine on that committee. He said, "Students must know their Keynesian economics." So he was always in favor of that. Then he, of course, was very fine to me, crediting me fully with this idea.

Burnett: Well, he clearly respected you as an economist. If you contributed to a key element of this theory, I think you were all right in his books.

08-01:40:45
Tolley: Well.

Burnett: In terms of friendships, these are professional relationships. A lot of departments are dysfunctional. A lot of departments have siloed individual faculty members who never work together, who have their own specialties, and they have their own communities at other departments around the world. That's common. The workshop system is often credited as being a kind of glue to connect graduate students with the faculty. It was an arena for performance and excellence, to move research forward. What was the social environment surrounding the department like? I don't know, was there an annual Christmas party? What were the friendships? Were there factions, were there cliques? The agricultural group obviously had agriculture in common and you worked and communicated; but you didn't publish with either Ted Schultz or D. Gale, right?

08-01:42:13
Tolley: Good point. No.

Burnett: Right. So in a sense, you had your own full set of research programs, for many years, running concurrently.

08-01:42:26
Tolley: Right.

Burnett: So you were busy, in other words. You had a large number of graduate students. And there was the Chile project, so Al Harberger had that to help run, with Ted Schultz. D. Gale Johnson has his own research interests. So you were working in the same domain, roughly speaking, but you each had your own research domains. How does it work for the graduate students coming in? Do they come in—? They would sit and often interview, and they'd come to work with somebody, primarily, right?

08-01:43:13
Tolley: Yes.

Burnett: And sometimes they would flip. Sometimes a primary would—. As a result of doing a workshop, they would realize that there was another person that they would want to work with, that that would become the primary.

08-01:43:27
Tolley: You may be right, but I'm not aware of students coming to work with a particular individual. They just came to Chicago. They got in here and then they looked around and found out who they could work with.

Burnett: So that was much more the norm?

08-01:43:49
Tolley: Yes, yes.

Burnett: Okay.

08-01:43:51
Tolley: Well, then there was the money workshop, and that was, of course, around Milton. Was the IO [Industrial organization] workshop around Stigler? Probably. But there were these various workshops and people would gravitate to those, but they were not big competing.

Burnett: They were always held at different times, right? There was never a concurrent set of workshops, right?

08-01:44:20
Tolley: Well, probably not. They were afternoons throughout the week. So I think people tried to avoid the conflict. But then there were affinities. There was Ted [T.W. Schultz] and Gale [D. Gale Johnson] and me, and we were obviously very close to Al and Larry Sjaastad, and maybe a couple of others. Arcadius [Kahan] was around.

Burnett: Margaret Reid?

08-01:44:51
Tolley: Oh, yeah, definitely. Of course, she was crosscurrent.

Burnett: Yeah. She did something on housing, didn't she, in 1962?

08-01:44:58
Tolley: She might have. I was so glad they mentioned her prominently at that thing last week. I'm so glad they did that. She was the apple-pie lady who threatened the graduate students.

Burnett: So she was a key element of the department?

08-01:45:21
Tolley: Well, she was. She was not as high-tech as they were, but she was—. I think Milton recognized that she was very key in the development of the permanent income hypothesis. She kind of had the insight that he formalized very much more elegantly.

Burnett: That's fascinating. So I wanted to ask— and we can free associate and move across the decades as needed — one of the things I think about is, what scholars at other institutions would you consider to be part of your orbit of thinking, if there's a thought collective at Chicago that extends beyond Chicago? It could be students, who then graduated and migrate, like NC State, right? Students or scholars who were initially at Chicago, that go somewhere else — go to Columbia and then come back, in the case of Gary Becker. Or, people who never went to Chicago and were never at Chicago as faculty, but who nonetheless had some kind of Chicago affinity for working on particular problems that you were interested in or that other scholars were interested in. Is there a larger Chicago-like community out there?

08-01:47:02
Tolley: Well, there are a lot of economists who are, should we say, simpatico and like that way of looking at things. If there're other leading figures, I'm really not sure. We mentioned Ciriacy [S.V. Ciracy-Wantrup, at UC Berkeley's Giannini Foundation]. I think Ciriacy was interested in me. He was a very fine economist, so we got along very well. But I wouldn't call him a Chicago economist.

Burnett: No. What about Anne Krueger, at Johns Hopkins?

08-01:47:35
Tolley: Well, probably, she ended up in Minnesota, didn't she? [Anne Krueger, University of Minnesota, 1958-82; Chief Economist, World Bank 1982-86; Deputy Managing Director, IMF, 2001-06]

Burnett: She's officially at Hopkins now.

08-01:47:45
Tolley: Is that right?

Burnett: Yes.

08-01:47:45
Tolley: Is she still alive?

Burnett: Yes.

08-01:47:47
Tolley: I see. Well, I would put her—. I didn't work—.

Burnett: So she was at Minnesota. When you were citing her work and—.

08-01:47:56
Tolley: Well, I wouldn't put her in the class that you're—. I didn't know her personally very well, so—.

Burnett: Okay. Well, what about Minnesota? Because Minnesota has Vernon Ruttan, it has Oswald Brownlee [and Anne Krueger]. And then I think of, in earlier decades, there would've been Iowa State, which had—.

08-01:48:18
Tolley: Yeah.

Burnett: There're people coming back and forth between Iowa State and Chicago for years.

08-01:48:23
Tolley: Right, Stigler and Oswald.

Burnett: Stigler, Lester Telser for a year. And of course, Margaret Reid and D. Gale Johnson and Oswald Brownlee all come from Iowa State.

08-01:48:35
Tolley: Right.

Burnett: So is there some affinity with Minnesota?

08-01:48:44
Tolley: Minnesota has had some very good people. They're also, in the macro field, they're very important. I knew Oz. I liked Oz. He was the first guy I worked under and so forth. I wouldn't classify him as a major figure. In the first place, I think he was more in the macro area than in the agricultural area. So who else are you mentioning? Let's see.

Burnett: Well, I'm not sure—.

08-01:49:21
Tolley: Well, you mentioned Vern. Well, Vern was a Chicago person.

Burnett: Yeah, that's true. But yes, I am trying to think of non-Chicago people who are Chicago-esque. Then of course, Al Harberger has a second career at UCLA, and he creates a really important international development, international financial institution, it's almost a feeder school for the IMF.

08-01:49:53
Tolley: I didn't know that.

Burnett: Okay, so people migrate out of Chicago to other places, and they work there for a while and they develop connections and so on. Then there's the common phenomenon — there's something kind of internalist about this — in that many Chicago products go away for a while, and they end up coming home to roost. There's a number of scholars who are in that category.

08-01:50:25
Tolley: Right.

Burnett: So I did want to kind of think of a contrary case. But maybe we can reflect on that for a subsequent session, to think about non-Chicago "Chicago" people.

08-01:50:40
Tolley: I'll be reflecting on that.

Burnett: Okay, all right.

08-01:50:43
Tolley: Did we—? Again, we're wandering around. Are you aware of the name of Marion Clawson?

Burnett: Yes, it rings a bell, but I can't place—.

08-01:50:57
Tolley: He ended up at Resources for the Future.

Burnett: Okay.

08-01:51:00
Tolley: I think he was probably in agriculture at one point. Anyhow, he was very interested in the national parks, and he proposed a twenty-five dollar fee to get into a national park, which at the time, was very controversial. But he was interested in the serious economic side of this recreation and so forth. He was important, I believe, at RFF [Resources for the Future].

Burnett: That's something to consider. Well, why don't we pause for today, and let's continue tomorrow and take us into the 1990s and the 2000s.

Interview 9: June 7, 2018

Burnett: This is Paul Burnett interviewing George Tolley for the Economist Life Stories project. It is June 7, 2018 and this is our ninth session, and we're here in Hyde Park, Chicago. We are moving into the 1990s and talking about yet another development of your interest in the ground floor of a new set of questions in economics, to do with health and health valuation. So in order to get there, I'd like to ask you about a paper that you worked on that had to do with some collaborations between some scholars at University of Kentucky and the University of Chicago and the Environmental Protection Agency. So this paper is called "Valuing Changes in Health Risks: A Comparison of Alternative Health Measures." It comes out in 1987, in the *Southern Economic Journal*, and it's Mark Berger, Glenn Blomquist, Donald Kenkel and you. So I'm wondering if you could tell us a little bit about the story around risk models for health. Why did we have this interest in trying to assess health in new ways? What was wrong with the old way of evaluating health economically?

09-00:02:15

Tolley: Right. What was the problem with it? There was Selma [Selma J. Mushkin of the Division of Public Health Methods of the US Public Health Service and later a professor at Georgetown University]. She was a Washington person. She got very interested in the cost of health, and got a lot of publicity, a lot of notice out of it. It was about how if you can't go to work, you can't earn money, that kind of thing. It's important in the sense that it was beginning to get into the economic consequences of it. However, it missed the main point, I think, that is that health is very important to human wellbeing. You can measure foregone earnings, which is what she was doing, and that's a part of it; but it's only a small part of it. So we were trying to get the rest of this. If you die, you and your heirs are going to lose some income. But the main think you'll lose is — I'm saying it wrong, in a way — is the utility that you get out of living. If you're going to try to be rational about this thing, you need to take account of that. If it's very small, then you don't pay much attention to it. If it's huge, if it's the main thing, then that's what you've got to grapple with. So in much of this, we were grappling with that. There are at least two parts of it. There's the morbidity and the mortality. We were getting deep into the morbidity, which had not been dealt with in much depth. We were getting into that in more depth. But then that's what it is. Is the value of life $6- or $7 million? Which, if it is, it's far greater than the foregone earnings. So we were wrestling with all of these things.

Burnett: And it's "Selma" you were talking about from Washington?

09-00:04:52

Tolley: Yes, I'm sorry—.

Burnett: We'll find it. But let's say that there was an actuarial approach to valuing human life, in terms of an early death due to an accident, let's say, and there's a payout for insurance and they calculate your likely earnings over the period of years that you could have been expected to live, as a normal person. A male at age forty-seven, how much longer would you have lived otherwise? These kinds of actuarial analyses that give you the cost of instant death or the cost of an illness. It's this accounting of either foregone earnings, the cost to a hospital for your stay in the hospital, rehabilitation, the cost of drugs, and you can add these things up.

But what you're talking about, is this other approach about a kind of hedonic or exchange-value analysis, where you're, in a sense, asking a person hypothetically, how much do you value being healthy? You put a price on being healthy today, tomorrow, the next day, and what's the total cost of that? The question is, what is the economics of that? When I was doing some research, hedonic economics is to do with Sherwin Rosen, a paper that he wrote in 1974. So can you situate this newer economics of health? Who's doing it, and how do you do it? How do you evaluate the preference for health? There are these phrases that come up: "willingness to pay." So we had this cost-of-illness approach, which is the older approach, and then these newer approaches that try to assess the utility, the personal utility that someone has towards their own health. So who are the big influences in that? Or were you kind of working this out with your colleagues at the time alone?

09-00:07:34
Tolley: Well, let's see. The Rosen paper is very important because it looks at the premiums that people demand to work in risky occupations. So that throws light on their willingness to pay for these mortality risks. That's certainly an extremely important part of this, and we did a lot of work on that. But there're other ways — this contingent valuation. There're other ways to look into this and there are other parts of this. The risk of death is one part of it; but the risk of serious illness is not covered by that approach. It's very difficult to get measures of that. Actually, a lot of this research was financed by the EPA, we were trying to get at some of these less-obvious, if you put it that way, less obvious effects on health, death rates from sulfur in the air and that kind of thing. You won't pick that up from just wage effects, as such. People don't know, in the first place, a lot about it. So we were wrestling with trying to get a framework to establish all of that.

Burnett: The older methods underestimate the costs?

09-00:09:20
Tolley: Yes. Oh, definitely.

Burnett: By quite a significant amount?

09-00:09:23
Tolley: Yes.

Burnett: I think you cited a study that was done in the end of the seventies. This, you would have encountered doing your environmental work. The scholar was named [A. Myrick] Freeman [III]. He was looking at estimating the quality-of-life improvement from the Clean Air Act. I think he did what he could. He compared mortality data from before the Clean Air Act came in to the present day, which was like 1978 or '79, and he came up with this number of — I don't know what it was — $17 billion or something. But he was comparing the mortality rates at 1970 and the mortality rates later, but not the full spectrum of health and the effects of that health impact that deprives people of all kinds of opportunities that you could put a dollar amount on. Using the new metrics, the amount of money saved was double the original estimate, using your newer technique. So it gives you a strong sense that this older accounting was missing quite a bit of the value of it. Can I ask you—? And we're talking about "contingent valuation." Contingent valuation, as I understand it, is essentially survey work. You're asking people, how much is it worth—? What would be a typical example of a contingent-valuation survey question? What were you asking people in these surveys?

09-00:11:17

Tolley: Okay, now you're taking me back. I'm really trying to recall. This is completely different, but some of the work that we got into for EPA was, what's the value of visibility? I know this is not exactly health, but we set up a camera, actually, in our living room, or dining room, of the Loop [downtown Chicago]. It took thousands of pictures, and then we would show those pictures under different degrees of visibility, and we would ask people, "How much would you be willing to pay to get this view rather than that view?" So that, I can remember. That's very graphic. On the health front, a lot of these were not that serious [in terms of] results. But we would describe the symptoms, and it's a very tricky business. A lot of it is still controversial. A lot of economists say, look at what people do, not what they say. That's certainly true, as I think we were saying yesterday. However, you have to get evidence where you can, and regression evidence, if you're not careful, can be very misleading. So that was my attitude in going into it. There is a whole science about setting up questions to avoid bias, and that's really what that's all about.

Burnett: There's a whole set of sections in your larger volume that is an outgrowth of this, that goes into great detail about the number of biases. Just in the surveys alone, I think they enumerated nine or ten different ways that you can [introduce bias]. But what's so great is that there's this real consideration of how you control for that bias and what are ways to get around it. But I think there was one example where they were asking surveys. I think what they discover is that instant death is not such a big deal, in terms of valuation. I think in part because it's so unknown. The experience of debility, the experience of morbidity is extremely costly, in terms of what people value.

09-00:14:59

Tolley: Right.

Burnett: People value being in good health a lot more than we thought, when you break it down. Just on the level of discomfort — not pain, suffering, and extreme things like that — how much would you pay not to have a cold tomorrow? Just for that twenty-four hour period?

09-00:14:16
Tolley: Yes. [laughs]

Burnett: I think we just take it for granted that you have to accept that every once in a while, you get a cold. But you can also do economic analyses of preventive measures, which I think is what's explored in this paper, as well. So putting a cost figure, pricing how much people spend on preventive measures, how much people spend on exercise, and trying to disaggregate that from just feeling better. But that's part of it, isn't it?

09-00:14:47
Tolley: Yes.

Burnett: "Feeling better" is a valuation of health, and it has a cost to it in time and money and effort. Eating well, spending more money on the right kinds of nutritious foods, there're all kinds of ways you can price out the preventive lengths to which people go to stay healthy. So it's an exciting new vista for economics with respect to evaluating health. It shows that it's a much bigger issue than simply the economic cost of a main breadwinner losing an arm in an accident.

09-00:15:37
Tolley: Exactly.

Burnett: Which is a conventional insurance, actuarial approach—

09-00:15:41
Tolley: Right.

Burnett: —which is only if an insurance has to actually pay out. But you're looking much more broadly, to look at these impacts.

09-00:15:51
Tolley: Right.

Burnett: So there's a cost-of-illness approach, which is that kind of older approach, and this willingness to pay, a somewhat-hedonic type of analysis. It has a big impact. I think it's, if not *the* most cited, it's number two, "Valuing Changes in Health Risks," both for you and for Glenn Blomquist and Donald Kenkel and Mark Berger. It's the early indication that you're getting into this area, as an outgrowth of all of your work in environmental economics, all of your work assessing pollution and the effects thereof. You're following these trends and leading these trends in the valuation of health. That's 1987. But this percolates for a long time, because 1994 is *Valuing Health for Policy*, which is the edited

volume that you put together. Can you talk about some of the people that you were working with and how you put this together? I understand it's thirty years ago now, but you do this paper and the research is supported by the EPA. In the intervening years, between 1987 and 1994, you're clearly collaborating and putting people together to work on these different chunks of the problem. Also you're on the board of the Center for Aging, Health and Policy, between 1980 and 2000. For the last two decades of your career at Chicago, you're on this board of this center. Was that a conduit for ideas and information and collaborations? Or was it more of the conventional thing in academic life, where you've been asked to be on a board and it's something you do out of duty, but it's not necessarily feeding new information and new ideas into your operation?

09-00:18:13

Tolley: Now, this is bringing back to me what it was. There was somebody named Bernice Newgarden. She was a leader in calling attention to problems of the aged. Because I was on that board, I met with her and doctors. That was a very broadening experience for me. There wasn't any research, as such; it was more just that we would meet and discuss the problems. I think I put on a conference or two for Bernice. A lot of it was educating doctors on how to think about these things. But I learned a tremendous amount from this. We would have breakfast meetings, and I learned that doctors are not particularly healthful in their eating habits.

Burnett: It's a real challenge to be well in that environment. But all this to say that you were encountering health professionals, learning about their challenges, and conveying some of what you knew about the valuation of health, health policy, health outcomes. All of you, at that time, are becoming more aware of the rising costs of healthcare, the increasing size of the older age cohort in the United States.

09-00:20:04

Tolley: Oh, yes.

Burnett: Was that already an alarm bell in the 1980s and—?

09-00:20:09

Tolley: Yes, it was. That's the kind of thing Bernice was very concerned with.

Burnett: Right.

09-00:20:15

Tolley: Then what's the value of a QALY [quality-adjusted life year]? A QALY is—this is from the public health people—they, of course, resisted dollar valuation like anything. Their approach, however, was, you have a piece of plastic, and at one end is zero; at the other end is one. You put a pin in the plastic. If it's perfect health, that gets a one; if it's death, it gets a zero. But if it's various stages of health in between, they give it a QALY. So there's a whole big

literature in the public health field about what's the QALY value of various things, of morbidity. So our question was, what's the value of a QALY?

Burnett: A dollar value.

09-00:21:16
Tolley: Yeah, what's the dollar value? It's $6- or $7 million, incidentally. It depends on the purpose and all that.

Burnett: Right.

09-00:21:29
Tolley: There developed quite an approach— this is up until the year 2000 — is the value of life for an older person less than for a younger person? How it varies with that. A lot of the economists, this had a big influence in government. There're so many things the government has to do that involves human life. But some economists started saying, well, you vary it by age. But that brought the house down. The public would not accept that idea.

Burnett: That a human life is worth less the older it gets?

09-00:22:09
Tolley: Yes.

Burnett: Yeah. That's interesting.

09-00:22:11
Tolley: I don't think we ever solved it. I'm still wrestling with, what's the value of the life of a child? That's a very interesting question.

Burnett: Yeah. There's a book called *Pricing the Priceless Child*.

09-00:22:25
Tolley: Is that right?

Burnett: Yeah. Which is about the health transition and the investment in education transition at the turn of the twentieth century. So initially, the child is an economic asset. It adds to the economic value of the family. Then there's a transition, over a period of a couple of generations, where it goes from being an asset to being this investment or a liability, depending on how you look at it, or depending on the day. [laughter] And that industrialized Western nations are defined, in some senses, by this extreme investment in a smaller number of children, right?

09-00:23:16
Tolley: Right.

Burnett: You raise that child to adulthood and you invest in their education, and that is your contribution; not that they're an asset that you can siphon off of in order

to add to your total family budget. So this is obviously something that is a moving target. As a society, we are valuing things in different ways. As we alluded to yesterday, there is the socialization to some extent, of medicine, medical care in the United States, and of course, the massive private insurance market. So there are these institutions that are trying to develop accurate measures of the value of human life, a dollar value. It's the courts, it's the government, it's the EPA, and the economics profession is trying to provide new tools or new ways of looking at it, in order to get a fully accurate picture. I think in your writings, you come to the conclusion that more information is better: don't pooh-pooh, don't dismiss the hedonic valuation or the contingent valuation work, because it gives you an added dimension, an added picture that needs to be weighted and adjusted and incorporated. That's really what you seem to be advocating. One of the things that struck me in the contingent valuation treatment in *Valuing Health for Policy*, the 1994 volume, was this set of surveys about the fate worse than death. So it's this real, it's exactly what you said: the instant death isn't worth all that much by comparison. What people fear is morbidity. What people fear is disease, chronic illness, chronic debility, lifetime debility. I guess what I'm struggling with intellectually, or even philosophically, is the role of that valuation, of something based on, to some degree, ignorance and fear. Because you're asking people—at one point—there's a survey, and over half the respondents value being "confined," in quotation marks, to a wheelchair as being a fate worse than death. Over half.

09-00:26:04
Tolley: Yes.

Burnett: Which may come as a surprise to those who do use wheelchairs. They consider it to be a "fate," but also their lives, that they value. So I'm trying to reconcile asking a random sample of the population, how do value losing an eye or losing your hearing or quadriplegia or burns to 70% of your body? All these things that virtually no one has direct experience with, right?

09-00:26:43
Tolley: Right.

Burnett: Because of how we treat people with disabilities and these kind of challenges, the general public doesn't know very much at all about what it's like. So let me ask you then, in that particular context, what is the value of that valuation? The dollar value is based on an irrational fear. The dollar value is based on something that they don't know anything about. So I don't understand that dollar value and how it's then factored in. Do you weight that and say, "here's the ignorance production function for this?" And say, we can't take half the population saying being confined to a wheelchair is a fate worse than death; we can't take that seriously, because of the clear experience of those who do live in wheelchairs and who do live and survive and thrive? I don't know. I don't know how that fits, necessarily.

09-00:27:54
Tolley: Well, you're raising a fundamental conundrum. I think there is an ex ante and ex post. People avoiding being in wheelchairs is a real motivation. For them, before it happens, that's true. If we're saving people from being in wheelchairs, that's something that's very much worth it to them. They would be willing to spend that money, even though when they get there in the end, they'll realize it's not as bad as they thought. So a person's perceptions change over life. I'm just thinking out loud. I would be inclined to take seriously the fact that people think it's a fate worse than death. Some people faced with this might well prefer it.

Burnett: Prefer death?

09-00:29:08
Tolley: Yes. I think a lot of people may, actually.

Burnett: Yeah.

09-00:29:18
Tolley: This probably hasn't been discussed. I'm trying to think of how we discussed it. Our main concern was avoiding bias, and we didn't too much raise questions like this. We probably should have.

Burnett: Okay. So now I understand a bit more about what you're doing. So for example, if it turned out that it's true that half of respondents, and half of those random respondents also represent taxpayers, their willingness to pay to avoid the, quote/quote, "fate worse than death" of being confined to a wheelchair is *x* dollar amount, could that number then be plugged into the justification for a research budget for spinal cord research that the federal government would support? So the National Institutes of Health would then point to a study saying, "look, the general public would be willing to pay $6- to $7 million a year each, if they could, to avoid being in a wheelchair. We can take that as a kind of consumer vote to fund research and to fund the avoidance — through medication or surgical intervention or therapy or whatever — to prevent someone who's in an accident or someone who has a chronic degenerative illness, from suffering a fate of debility such as that. Is that a possible way to think about this kind of contingent valuation?

09-00:31:05
Tolley: It certainly deserves to be in the mix, let's put it that way. I'm not sure I would personally carry it that far, but maybe I would.

Burnett: So just to continue with this example, let's just take this example of the valuation of avoiding being in a wheelchair. When you wrote about incorporating cost of illness with contingent valuation and preventive measures, what are some of the economic problems or questions around incorporation or integration of these data, to come out with a dollar amount or a dollar value for something like that, that kind of health valuation?

09-00:32:08
Tolley: Well, as I say, I think our concern was to avoid bias and to get people to think about these things. Usually they don't even want to think about them. When you first bring it up, you encounter all kinds of resistance to even thinking about it. So a lot of it is education on probabilities. I know we asked about death by heart attacks. We had these games where you'd play poker, and if you draw the wrong card, you die by heart attack. So most of it was along those lines. I know that the question you're raising, of course, is fundamental. We probably should've been more concerned with it than we were. I think again, we were more concerned with the idea that you could elicit these values through contingent valuation that other people were not even considering at all, or we're saying, well, you're really got to do this through the Rosen approach, which, of course, is fundamental. But it's really quite limited, when you think of all the phenomena that are out there.

Burnett: In part one of *Valuing Health for Policy*, it enumerates the valuation approaches. The conclusion of the 1970s and eighties cost-of-illness studies, the review of that literature is that foregone earnings is neither precise nor reliable [as a metric]. So that's another aspect of it, too, is that the way those cost-of-illness studies had been done, it's not an accurate reflection, even on its own terms. And then beyond that, it does limit the kind of positive side of it, which is the valuation of health, saying that health is not a non-economic state. But this does go back, as you said. You talked about fighting. If in the public health world— which is very advanced statistically—

09-00:34:39
Tolley: Yes, yes, it is.

Burnett: Enormously so, and the disability-adjusted life years and all of this, so these are extremely sophisticated techniques for assessing things. But the idea that there is something morally problematic about attaching dollar values to aspects of your health. What's that uncomfortable game that people play? "Which would you rather?" You know this game? Where you say, "would you rather lose your arm and be unable to—" It's a choice between two horrible things. It's a really macabre icebreaker that people engage in, and they have to justify it. Would you rather be blind or would rather be deaf? And then people would have different perspectives and different justifications for it. But the fact that it's a macabre parlor game is evidence for how uncomfortable we really are about talking in economic terms about health. We want there to be infinite resources available for health. This seems to cut across the political spectrum. Remember all the anxiety around the 'death panels' that the Obamacare, Affordable Care Act was supposedly going to put in place?

09-00:36:08
Tolley: Yes, yes.

Burnett: And the right using that as a cudgel, and then on the left, of course, this suspicion that health economics itself is some kind of backdoor for austerity

measures and cost cutting and rationing of care. So across the political spectrum, there is a moral suspicion around this kind of research. But your position is, you want to understand it. If it's true that we have these really large valuations of health, large dollar valuations of health, what are the consequences of that, if we're now facing higher costs of healthcare or facing an aging proportion of our population? [If] this is going to place more and more demands on our economic activity, and it's going to take up a greater and greater part of the economy, we ought to have a very clear understanding of how much all of this costs.

09-00:37:28
Tolley: Yes.

Burnett: This is considered one of the ten basic texts in health economics, and in this whole area of valuation of health. Can you talk about the influence of this kind of analysis? On the face of it, you can see how this type of thinking has become part of the fabric of our health systems. Can you talk a little bit about the influence of this type of research? If you don't want to salute your own work, that's fine. But what is the impact? What changed as a result of doing these kinds of inquiries in the 1980, nineties, and 2000s?

09-00:38:39
Tolley: Oh, I think there's a much more open and fuller discussion, fuller analysis, of the economic values involved here, and people are willing to talk about them in ways that they weren't before. For better or worse, I'd work on these problems, then I would go on to something else. But there's a whole cadre of people left working on them. Don Kenkel, for instance, is, and Glenn Blomquist. But there are others—Kip Viscusi. There's a whole cadre of people, a whole discipline, if you will, on the value of life now. People are willing to discuss it.

Burnett: Can you talk about Donald Kenkel. He's a Chicago graduate.

09-00:39:41
Tolley: That's right. He worked with me.

Burnett: Right. And Glenn Blomquist, of course, you've co-published papers and edited volumes with him over the years. Mark Berger, he was at Kentucky.

09-00:39:53
Tolley: He was at Kentucky. I don't think he was ever here. He is the econometrician or the mathematician.

Burnett: Okay.

09-00:40:02
Tolley: That article — I was very busy, very, very busy, and we wanted to do something. Actually, I've written some of my most important things over Thanksgiving weekend. My contribution to that article was done on a

Thanksgiving weekend. Then Mark and Glenn took it and made the article. I never would've done it on my own; I was too busy doing other things.

Burnett: Well, that's the value then — earlier, I asked you about the cost to you of doing all this academic advising, because there's this story from the sixties and seventies, of the line of graduate students outside your office, waiting to talk to you. But you turned it into an asset. You talked about you'd have an idea and you'd like to run with it, and there was a student, or a student inspires you with an idea. Did it also go the other way, that the graduate student introduced a project to you as an idea?

09-00:41:15

Tolley: Well, sometimes; but mostly it was the whole framework that we were pushing together. It more came out of that. I don't know whether it came out of them or out of me, while pushing the whole thing.

Burnett: Are you a framework pusher? Is this a category of academic work? So in other words, I think the term, in history of science, that we use is "research entrepreneur." A research entrepreneur is someone who connects funding and more importantly, the project or the impetus behind funding, to their own graduate students or colleagues that they work with, over a period of years. They move from project to project, just keeping the thing going. So one person you think of as a really good example of the research entrepreneur is T.W. Schultz; D. Gale Johnson would be another. You seem to have taken that orientation, as well. You don't work in a silo. How many of your—? I think there's the total list of your — for those who are interested, there's a 2000 paper in your honor, after you retired, celebrating your achievements, and it goes through the list of publications. Something that's striking, it's ninety-something publications, and seventy-something collaborations. So the vast majority of your output is about collaborations, and as you say, frameworks. So you're a framework entrepreneur. You're a research entrepreneur who puts together the needs coming from an outside source — the government or a private foundation or another university that wants to collaborate — and you connect that into a project that involves colleagues, former graduate students who also go out and become research entrepreneurs on their own. Is that a fair description of the George Tolley approach?

09-00:43:35

Tolley: Well, it may be. I never thought of myself as a research entrepreneur. I don't know that term, as such. I think there are these problems out there and there's funding comes up, and you see a way to apply some economic thinking to them that hasn't been done yet, and here's a golden pot of money to do that with. So that's the way I think of it.

Burnett: Yes. Just as a kind of contrasting case, you could have a professor with tenure whose job is not really under review, whose academic output would just be whatever they wanted to work on. It wouldn't necessarily have to bring in

money. Lots of people just write books; they get tenure and they write books, or they don't write books at all. That's less and less common now. But what's exciting for you is projects, multi-year funded projects, where you get to work with other people. You said in earlier instances that you didn't necessarily meet face to face, like with the Argonne work, right? But you were hiving off into small groups that would have breakfast together or coffee, and you'd talk about the problems. Is that part of the methodology for you, is thinking with another person to produce to research, to show drafts to? In other words, is there something social about economic work, which seems to be so much about individuals? Is there something social about economic research for you?

09-00:45:34

Tolley: It must be, although I must say, I spend an awful lot of time alone here writing. There's something about that. I got this recognition from the Society for Benefit-Cost Analysis, so I've been writing to the people who contributed, thanking them. A couple of them have said, quite gratuitously, that I was able to impart to them the excitement of knowledge and germinating knowledge. They say they do that with their own students; but they say they don't keep them up till midnight doing it.

Burnett: [laughter] So there was that. That was from the night-owl period of George Tolley?

09-00:46:32

Tolley: Yes, right.

Burnett: Well, many of the people I talked to said that you taught several things: one was how to think critically about things, how to think carefully about things; and the other was how to behave towards others. There was a generosity of spirit. And they learned how to corral their graduate students. They learned how to be research entrepreneurs themselves, if I can use that term; it might not end up being accurate, but that's a term that seems to fit. There were some who I think it's fair to say, said that you transformed their lives. So they were very emotionally moved, just describing the impact that you had on their lives; that things would've turned out completely differently, had you not been an advisor and a friend and a colleague. I think that that speaks to the kind of impact that you have, that you may not realize, if you describe your work as spending most of your time alone, writing. But you do have this impact. You did have that impact on many people who were your students and who were your colleagues. I think that's a part of the model, if we can be so clinical about it.

09-00:48:24

Tolley: So some of this, a little bit of this goes back to T.W. Schultz, when I was on the ag team. He was very good at not investing all that much of his time in his students. That's an odd thing to say, but he would delegate, probably to me and to Gale both. We were the persons who met one on one with these people all the time. I certain thought, at many points in my career, I'm sacrificing so

much of my writing time to meeting with these students. But it worked out okay in the end.

Burnett: Well, of course it did. But it reveals a different style. It goes back to that statistic I quoted, that the proportion of your works that are edited volumes. You've contributed, and you said you've contributed a lot of ideas to the works that were, officially, authored by other people. So there's that, as well. But you facilitated these research projects and the framework. You literally describe it that way. I think in *Valuing Health for Policy*, I think the framework for thinking about this is part of the title of the first part. So you lay out a theoretical framework, an empirical framework for gathering data and analyzing the data, and a leading role in organizing the work. So some of it might've been a sacrifice to direct writing, but it's another style of academic work that's yielded a lot. And it's yielded a lot of very strong connections to institutions beyond the department of economics, which is a kind of Schultzian thing to do; that you have these strong connections to the World Bank, work that had come out of Resources for the Future, the Environmental Protection Agency, the Argonne National Laboratory. The list goes on. What is the value of that? It's going to sound absurd, but there's a kind of priceless value for an academic who is willing to bring out the best in students and to invest in them so that they shine, so that they go on to produce their own genius work. But it's interesting that you describe the Chicago ag group as a team. T.W. Schultz was the leader, I suppose, of this team, it's probably fair to say.

09-00:51:38
Tolley: Yes.

Burnett: But it's a team that had functions to it. You were doing something that was not so subordinate to Schultz's work. I think it was amplifying it by connecting these graduate students up, because he would've been doing that if you hadn't, right? I imagine.

09-00:52:07
Tolley: Yes.

Burnett: And he had done that with several students for years, including D. Gale Johnson, for crying out loud. Right? So I think that there's this really strong tradition in the agriculture group. There's something special about it. I think we're reaching the point in the historiography of the Chicago School that we can say with a fair bit of confidence that there was the ag economics approach coming out of Iowa State, through Schultz and D. Gale Johnson, that is a big part, if not *the* part, that constituted the workshop system.

09-00:52:50
Tolley: Oh, I would certainly agree with that completely.

Burnett: Yeah. There was a workshop system in Iowa State. The first workshop was agricultural economics. Schultz was leading the department from '46 to '61. Everyone can look at that and figure out what happened. But I think it's fair to say that that is where that leadership for that particular scholarly innovation or pedagogical innovation lies. So I did want to talk about students and keep track of students, and they're now colleagues, by this point, by many decades, when we're getting into the nineties. But you *continue* these relationships. That's what's interesting. You have a multi-decade publishing relationship with Glenn Blomquist, a multi-decade publishing relationship with Philip Graves, a multi-decade relationship with Donald Kenkel, and Vinod Thomas. So at least four. I don't know what the span is for Barton Smith, if it goes into the eighties. But so there's at least four or five people that you have—.

09-00:54:04
Tolley: Well, Barton would certainly be in that group.

Burnett: So now six people, at least, with whom you had a multi-decade collaborative publishing, academic, and friendship relationship with. That's, I think, pretty unique, fairly unusual in economics, fairly unusual in the social sciences, really. So that's, I think one of the reasons, I think, why there's a lot of sentiment of tribute towards you is because of that I impact that you've had in their careers and their lives personally, even to the extent of the journals that you helped found. The Society for Benefit-Cost Analysis has recently celebrated you. I'm losing the name of the honor, but it's "honoring-a-member award" or something strange like that [2018 Honor A Colleague Award].

09-00:55:17
Tolley: Yes. I'm having trouble with that, too, but yeah.

Burnett: But it is their award for contributions to that field. So you are honored and feted by that community, by urban economics, by environmental economics, by agricultural economics, and by health economics now added into the framework. You had a modernizing influence on agricultural economics, which is a very old field. But you helped to turn it into something different. We can talk about that later, maybe. But you're in the ground floor, let's say, of several subfields of economics. So that's something worth considering, as we're making our way through this material. So I just want to finish up talking about *Valuing Health Policy*. It's got these five parts to it. So you're trying to get away from the public health literature, where life is priceless, you can't put a price on it, where discussion of dollar amounts is inappropriate. So you run through the valuation approaches that we've just been talking about for the last while. You talk about contingent valuations and all the issues involved in biases and questionnaire design and that kind of thing. Part three is about the valuation of morbidity, and a life-cycle approach. Is this what you were talking about with respect to the evaluation of an older life versus a younger life?

09-00:57:30
Tolley: Well, it was certainly a big part of that at first, yeah.

Burnett: It's basically, when you're breaking down these parts, each one of these parts of this significant and large book unpacks a whole bunch of assumptions and dangers and risks in evaluating risk, in evaluating the valuation of health. Then the last part, the title of it is "State-of-the-art health values." So once we've been moved through the dangers around contingent valuation, dispensing with a lot of the cost-of-illness work from the seventies and eighties and tried to move to something else, you're kind of announcing the different ways that we need to think about health going forward, the value that individuals place on their own health. So there are these different ways of chopping it up: it could be symptom-specific, it could be disease-specific or period-specific, life cycle-specific. So it's just a wide range of ways of analyzing things. And there are surprises in here. We talked about one at length, that the valuation of morbidity, even for a short period of time, is often way higher than instant death. I looked at one of the table that you had. It was interesting because one of the highest-dollar-value disease categories was dialysis for kidney failure. And it was way higher than a lot of the other things that you would think. It's just below cancer, but higher than a lot of other violent, harmful injuries and diseases that are quite debilitating. So you get a sense of how asking people to value their health in terms of different types of debility can kind of open your eyes to what it is that people are placing a value on. That undoubtedly has consequences for policy. So at the end of this volume, there's a consideration of the applications of this kind of research. You point to health and safety regulations, cost containments, research spending — so that figures into what we were taking about earlier — preventive medicine, legal decisions, and clinical practice. But one of the really important things that you emphasized is to assess changes in health, rather than the total cost of an illness. Can you talk a little bit about why that's important? It sounds like an economist talking, right? Assess the change. What's the change at the margin, right?

09-01:01:31
Tolley: That's right. Well, that's what it is.

Burnett: Right, it's an economic framework for understanding something.

09-01:01:38
Tolley: Right.

Burnett: It has a vivid example, too. The total cost of AIDS in 1986 is $*x* billion. Then what you're writing, or you and your coauthors were writing, what do you do with that? It doesn't mean anything by itself. What is its relationship to other things? What is the increase or decrease? What are the variables that contribute to that cost? So you're asking for marginal analysis; you're asking for a disaggregated analysis, so getting a real handle on what are the contributors to the valuations of the different components of this disease

phenomenon and how it impacts different aspects of society. Is that a fair characterization?

09-01:02:41
Tolley: Yes.

Burnett: Yes. So this is now into the 1990s. You're still publishing on a wide range of things. There's a report that comes out. It seems to be a collaboration through your firm, which is RCF Consulting. I say that only because there's one coauthor who is from RCF. But it's a strong Chicago connection, too. One coauthor is Peter Bernstein, who is a University of Chicago MBA; and Michael Lesage, who has a master's from the University of Chicago. It also seems to be part of or for the Employment Policy Institute. It's called "The Economic Analysis of a Living Wage Ordinance." Do you remember this paper?

09-01:03:44
Tolley: I do, yes. That was an RCF paper, and Peter and Mike were both for—. It still is true. The main staff at RCF is from Chicago, so there are a lot of Chicago people involved with it.

Burnett: Okay. That's your reservoir, the University of Chicago.

09-01:04:08
Tolley: Yes.

Burnett: Okay. So the context around this is interesting. It's late nineties, so this is the tail end of the tech boom, so prices in major cities are rising. It's a real boom economy in the United States. It's addressing the question around the living-wage movement, for minimum wages to reflect the increased cost of living in major cities. This was happening across dozens of cities at the time. I wanted to ask you about it, in part, because it harkens back to research that you were doing with *Urban Growth Policy*, that volume in 1979, and work that goes back to 1970, even. But it's something you do sporadically. I wouldn't call it a full research program, this question of fiscal externalities. But it was to help the city government deal with the call for a minimum wage. There was an ordinance that was going to be voted on, and you were being asked to report on this. So we already, from the earlier parts of this oral history, we already know why this report would look the way it does. But this is a topic that does not go away. So today, there are calls across cities and there is a movement for a federal minimum wage of $15 an hour, and cities are moving to this. Seattle has moved to a minimum wage in that territory, even higher, it might be; Oakland and other places. So this is a topic of real relevance today. So can you talk about that study and how — if you wanted to sell someone who was an advocate of the minimum wage, who was saying that this is something we need for the people living in the city because they're impoverished, they can't afford the rapidly increasing cost of living — so how do you explain why that minimum wage is not a good idea?

09-01:06:58

Tolley: Well, a lot of the major arguments, I haven't thought about for a while now — but one of the major things is that it actually discriminates against the poorest, because it gives the employer the incentive to hire people who are worth $15 an hour, instead of $10 and hour, and that kind of thing. So that's probably the first place that you run into it. The fundamental thing that came out of "Welfare Economics of City Bigness," really, is that the optimum wage, if you want to call it that, is not uniform nationally. If you're going to have minimum wage, you should let it vary. I think there's more and more attention to that. It was very difficult in the beginning because the federal government was having difficulty enough just measuring the cost of living, if you will. They said, oh, golly, if you're going to vary this by everyplace in the economy, you've got a big problem, and people didn't really want to pay attention to that problem. But those are some of the things that you have to consider.

Burnett: Let's say that you allow the variance, the cost of the variance to just be passed to the cities. So you say, let cities vote for and establish their own minimum wages. Given your analysis of urban economics, what happens if you raise the minimum wage in, say, Chicago? What are the likely consequences of that, economically or socially?

09-01:08:51

Tolley: Well, I think it is going to exacerbate the problems of unemployment and underemployment of the poor black youths that already have so many challenges. I prefer the Arne Duncan solution. He catches people who are just emerging into the labor market and works with them one on one, to get them to know how to participate in the labor force and increase, if you will, their productivity. So in terms of policy, that's the more fruitful way out, in my view.

Burnett: Right, instead of a kind of across-the-board policy. Well, the other piece of it, it has to be funded. So it then will constitute a tax on the city taxpayers.

09-01:09:57

Tolley: Probably that's right. And the city's employment. It makes it a less attractive place.

Burnett: Right. So for employers, if they could just move their operations to just outside the city, it's that suburbanization phenomenon that you talked about in your earlier work.

09-01:10:17

Tolley: Right.

Burnett: So this is an instance where there was a local and fairly immediate impact.

09-01:10:35
Tolley: I think that work was, basically, Peter did that work. I don't know what you're quoting. It was picked up by the Employment Policies Institute.

Burnett: That's right.

09-01:10:47
Tolley: It's a Washington think tank.

Burnett: So they ended up kind of sponsoring the project?

09-01:10:56
Tolley: Well, I think they just picked it up and published it. I think the city probably—.

Burnett: Well, it says that the report was at the request of the Chicago city government. In 1996, they were going to vote. The aldermen were in favor of a fairly significantly in favor of the minimum wage hike. There was something like a 79 percent hike for the minimum wage of Chicago. It lays out the cost to the city, to firms, the lost jobs, the cost per employee, and then the raise to the eligible employees, which was lower than the cost, because of all the administrative costs and all that. So some people think the reaction to this kind of research is: "it's just self-serving; of course people don't want to pay taxes, so they're going to come up with some data that shows how it costs more."

09-01:12:10
Tolley: Well, that's a matter of opinion.

Burnett: But the report was presented to the aldermen and it was killed in subcommittee, the ordinance.

09-01:12:21
Tolley: Yes.

Burnett: Then two years later, they passed a watered-down version that was just going to require the minimum wage for those who contracted with the city. Then the aldermen voted themselves a $10,000 raise.

09-01:12:40
Tolley: I see. That's Chicago.

Burnett: That's the Chicago way? Okay. It's interesting that that's in the report, was this little addendum. But that's not really a Tolley approach to things. It's a bit too close to the kind of political world.

09-01:13:04
Tolley: Right.

Burnett: Right, it's not something that you do too much of or that you're as interested in. It's not as interesting to you because you're thinking about the

methodological challenges of getting at economic truth. How can we measure something? How can we understand its importance? Well, to that end, we could sort of open it up to talk about some of what you consider to be your most important methodological contributions. The papers that weren't necessarily the most cited, that weren't necessarily the ones that got you tenure or something like that. But by a different metric, something that you are proud of as an economist, that you felt was something that was a real contribution. So going back in time — we can range freely over a number of these things — let's go for something that is actually one of your most cited papers. It's from 2002. It's "Plant-Level Productivity, Efficiency, and Environmental Performance in the Container Glass Industry." It's with G.A. [Gale] Boyd, and J. [Joseph] Pang. It is looking at increases in productivity and/or productivity losses from emissions control. So they're making changes in this container glass industry that are doing two things. There's a certain environmental inefficiency, but there's also this increased economic productivity. So why is that paper important, do you think?

09-01:15:10
Tolley: I'm really not sure. Gale Boyd and the other person, that was an example of my cooperation with Argonne. Those are Argonne people.

Burnett: Okay.

09-01:15:23
Tolley: Gale Boyd was a real digger at the data. We sent people to this place in Maryland or someplace, where you have to get permission to go in and look at the data.

Burnett: Where was it?

09-01:15:40
Tolley: Is it Suitland, Maryland?

Burnett: Oh, Maryland? Okay.

09-01:15:44
Tolley: Anyhow, so there was a lot of that. But I think it was trying to get at some of these things at the micro, micro level. That was probably why it was so cited, but I was not aware that it was so—.

Burnett: Yes, "Valuing Changes in Health Risks" is your most-cited paper, and this is the second most.

09-01:16:12
Tolley: Really?

Burnett: Yeah. I think what's attractive to people about this paper is part of a literature. By this point in history, they're beginning to look at win-win scenarios, where you're looking at incorporating environmental efficiency into your overall

productivity data, instead of saying, changing your operations is going to be a pure cost. You can either be more productive and polluting, or save the environment at a tremendous cost to your operations. This is one of those articles that's saying, you can have your cake and eat it, too.

09-01:17:00
Tolley: I see.

Burnett: I can only assume, because that is what it's saying. You're trying to incorporate environmental aspects into the assessment of productivity and overall economic performance of the firm. So it is a contribution to micro, in that sense. While we're in the 2000s, something happens. At the beginning of this decade, you retire. So can you talk about that? Can you talk about the retirement? When did you decide that you were going to hang up the Chicago pen, at any rate?

09-01:17:51
Tolley: Well, I didn't really hang it up; I continued to do most of the things. I continued to teach and research. I guess I was doing more of the research, down at RCF. See, I'd done all this Argonne work, and then I was preparing for this, I was trying to recall, how did that get transferred downtown? For instance, that study you just referred to, that had nothing to do with RCF.

Burnett: It must've been Chicago?

09-01:18:30
Tolley: Yeah, it was. So partly, I think it had to do with the fact that I didn't want to have a conflict of interest. If I was spending too much time down there, I didn't want that to reflect on this.

Burnett: Right.

09-01:18:49
Tolley: So I'm not sure that I retired; I was emeritus officially, but I kept on doing many of the same things. My teaching has cut back in recent years more. At that period, I didn't really cut back on that.

Burnett: Really?

09-01:19:10
Tolley: Yes.

Burnett: Well, this is a trend that was happening at different research universities, that there's this tremendous asset for the quote/quote, "retired" senior professor who continues a relationship with the university. Did you take on new graduate students after you retired? Were you allowed to?

09-01:19:30
Tolley: No, they didn't want me to do that.

Burnett: Okay, yeah. That's one sort of sacrifice. But Berkeley made arrangements in the nineties to figure out ways to keep retired professors kind of engaged with the campus. It sounds like Chicago does the same thing, where you decided you wanted to have that relationship, I think.

09-01:19:51
Tolley: I think several people do it, I don't know.

Burnett: Yeah. Well, T.W. Schultz retires in '67. When did he stop coming to campus regularly?

09-01:20:04
Tolley: I forget. He kept coming forever.

Burnett: Yes. There are publications of his coming out in the 1980s.

09-01:20:11
Tolley: Yes, certainly.

Burnett: Right. So is this again a kind of ag-team model? And the same with D. Gale Johnson. He retired, but was still active, right?

09-01:20:23
Tolley: Oh, no question.

Burnett: Yes. And he passes around that time, too, doesn't he? 2002, I think. [April 13, 2003]

09-01:20:29
Tolley: I can't remember.

Burnett: So at any rate, the University of Chicago benefitted from your sticking around and continuing to publish and be a presence.

09-01:20:44
Tolley: We haven't mentioned Sabina Shaikh, have we?

Burnett: No. I think we did, but not in any detail.

09-01:20:54
Tolley: She was a product of [University of California] Davis, incidentally. Her father was teaching at Milwaukee, at the University of Wisconsin. Anyhow, she wanted to come back to the Chicago area. So she discovered RCF, and she worked at RCF for many years. Then she managed, I guess through me, she began teaching, undergraduates, I think, at the University of Chicago. Then Sabina and I, for several years, gave a course on the economics of the environment. People are still— at the recent dedication of the exhibit over at Saieh Hall, they had a reception afterwards. As happens frequently, someone came up and said, "Yes, I took the course with you and Sabina Shaikh, and it's made such a big impression on me."

Burnett: Oh, that's great. That's great.

09-01:22:01
Tolley: So we kept on doing that for quite a while. And I've been teaching with Steve [Stephen] Berry in the chemistry department, on the energy problem, more recently.

Burnett: Well, the 2000s are really characterized by a research interest of yours, which is energy — alternative energy or future energy requirements, and technological solutions thereto. So that's something that you start doing as part of your consulting work, because now that's your major conduit for research activity, now that you're retired from the University of Chicago.

09-01:22:45
Tolley: That's true.

Burnett: So there are several reports that you put together for the United States Department of Energy and Argonne National Laboratory, and collaborations with Donald Jones. So I'm wondering if you could talk a little bit about those. One comes out in 2004, then another 2008, another 2010. The first one is called *The Economic Future of Nuclear Power*. Can you talk a little bit about nuclear power in the 2000s and why the Department of Energy was interested in pursuing this research with you?

09-01:23:33
Tolley: Yes, I think the genesis of it, interestingly enough, was that Argonne was operating kind of a sub-laboratory. Was that in North Dakota or one of those places? I forget. There was a move to shut that down or do something, and Argonne wanted — and the University of Chicago wanted, because it was still being operated by the University — basically, a rationale for keeping that lab. Somehow it came down to, should we be working on nuclear power? The folks at Argonne came to me to do this study. So that got funded through the Department of Energy, through Argonne, which is a creature of the Department of Energy, to RCF. It turned into a study of the effects of the economic viability of nuclear power. We were into Bush [George W. Bush Administration] by this time.

Burnett: Yes.

09-01:25:10
Tolley: So it was picked up. I think it was used in one of the presidential addresses. The Bush administration was in favor of nuclear power, and we took a hard look at the economics of it. Turned out that MIT, at the same time, John Deutsch, they did a similar study and came out with the same results. Anyhow, then that whole thing got a lot of publicity and was used in political ways, in some ways, and I didn't pay much attention to it. Then these other studies were follow-ups on that. One was for Congress. I think the second one was for Congress.

Burnett: The second one was a response to a provision of the Energy Policy Act of 2005, which involved a strategic reduction in the reliance on imported oil.

09-01:26:14
Tolley: I see.

Burnett: So that was one aspect of it. The 2010 DOE report on hydrogen production, that's a different topic altogether. Were you asking if it was a follow-up, because this is the hydrogen economy. The other ones are on hydrogen, not nuclear. Or is there another nuclear follow-up?

09-01:26:42
Tolley: No. Well, there was one that was for Congress, and it was, what will be the economic effects of a transition? Maybe that's out of oil.

Burnett: Yes.

09-01:26:53
Tolley: That's probably what it was. So that was a follow-up to that. Then the third one, that was called—

Burnett: *Hydrogen Production and Delivery Infrastructure as a Complex Adaptive System*.

09-01:27:12
Tolley: Yes, right. So that is using a technique, a micro-macro technique. We cooperated with Argonne on that. They took the metropolitan area of Los Angeles that has 7 million cars, but they broke that down into 7,000 cars. Then we did a model of the city and how people drove back and forth to work and all of that. Then what would be the effect of a transition to hydrogen vehicles? They said, we'll assume that hydrogen vehicles will be viable in the year 2017 or something like that. What will the transition be, as people gradually give up the older cars? Being a little critical here in hindsight, the first thing we asked them, what is going to be the price of this car?

Burnett: Absolutely crucial. [laughter]

09-01:28:31
Tolley: At that time, I'm not sure there was a single economist in the Department of Energy, and it was really hard to get that across.

Burnett: Oh, my goodness.

09-01:28:40
Tolley: So anyhow, that's what that analysis was about. That was a lot of fun, to do that work.

Burnett: It reminds me of a quip. In the mining industry, there's a story that goes around. I don't know how true it is. This is pre-Trump, but they were complaining that in Obama's EPA, there was not a single mining engineer.

09-01:29:04
Tolley: I see.

Burnett: They were advising all kinds of things about phasing out coal and this kind of thing, and so they were very up in arms about that. But yes, you want the right expertise. And if you're talking about getting people to buy things, you would want an economist to be in the room, at least.

09-01:29:20
Tolley: Yes, that's right.

Burnett: So this is fascinating. You have long experience thinking about energy, pollution, urban infrastructure, change over time with respect to the integration and an incorporation of new technologies. I think one of the things on the table, new nuclear construction in the United States was frozen after Three Mile Island, as far as I can tell. United States has a tremendous number of nuclear plants, but they're mature, they're aging. They're forty years old now, for the newest ones. You're talking about restarting the nuclear industry. But the fascinating and possibly frightening thing about it is that the reason it would cost so much is to actually get the experience and expertise to build the first new models, because it's been so long. It's been twenty years since they had someone involved in the design of a new model of reactor.

09-01:30:40
Tolley: Right.

Burnett: It points out the cost of letting industries or technologies lapse completely. It's a very direct lesson, in the sense that you were saying in this 2000 report that a huge cost of nuclear power today is producing *de novo* the next generation of designs. Once you do that and scale it up and get twenty, thirty, forty new reactors going, the cost per unit of energy drops to close to that of coal and natural gas. So that was the first, most important lesson that came out of this. What's striking historically, looking at this is, just in 2003, only fifteen years ago, coal was 50 percent of US electrical-generating capacity, and natural gas was 17 percent. Now they're about even, maybe with natural gas having a bit of a lead, right? So that's a dramatic change that had nothing to do with the deliberate efforts to phase out coal or anything like that; it was the tremendous growth in new techniques for extraction and processing of natural gas.

09-01:32:22
Tolley: Right, that's been the basic change.

Burnett: That's the basic part of it, yeah. Were you ever interested or attracted to that story? As an economist, is that something that piques your interest, the energy mix of the American economy?

09-01:32:38
Tolley: Oh, yes. One, I'm interested in it. Two, as I say, Steve Berry and I teach this course on energy, and a lot of it is about that. It's understanding the basic economics of what's going on. Before fracking, nuclear energy was kind of breaking even. Before fracking, the electricity utilities, the nuclear operators, they were trying to get these contracts extended. The lives on paper were running out, so they were applying. That was a big thing. Do you know about Indian Point [nuclear power plant]? [New York Governor Andrew W.] Cuomo had come out to close Indian Point and Entergy didn't want to close. It was a huge study. I was a small part of that. They [the State of New York] had claimed that property values would be adversely affected by nuclear plants, and they hired somebody who purported to show that, whose analysis was, frankly, terrible. I won't name names here. Anyhow, I was involved heavily in that. Then there was the Pilgrim plant. I've done some testifying in all of that. But nowadays, Entergy is trying to close those plants. Because of fracking, they've become uneconomic. That's kind of where we are right now. If I may add, my bag is, as we studied all this, it's apparent that they're building nuclear plants in other countries. All over the world, there's a nuclear [construction] explosion going on. Yet the consensus in the United States is that nuclear power is not viable. I really want to look into that. I'm sure the other countries are subsidizing this in some way. But I really want to look into it, because nuclear is not all that bad. It has zero pollution.

Burnett: Yeah. As long as you can figure out. It's such a strange, weird political case, where certainly, allowing for, you don't build a nuclear reactor on a fault line or—

09-01:35:40
Tolley: Well, exactly.

Burnett: —you don't build it where a tsunami is going to swamp it. Or if you do, you have all kinds of redundant safeguards in place.

09-01:35:48
Tolley: Right.

Burnett: And they didn't. So it's zero pollution, except for the waste that needs to be stored. They spent billions of dollars to find a completely geologically inert place in Yucca Mountain, but people were so anti-nuclear and nuclear waste, they didn't want it being transported through their territory. So no one would allow it to get to Yucca Mountain. That was the sticking point. So there's all kinds of fears that people have around nuclear energy. Meanwhile, we're perfectly happy to frack and poison our way to a kind of fossil-fuel future, and it's just happening by default. So as an economist, policy advisor, are you just

comfortable just focusing on the cost as an economic cost? Let me put it this way. The values of an economist, when you think about having an impact, are there projects that you've worked on where you really just wanted to focus on the cost and it's just an efficiency issue, or were there externalities that drove you crazy? Were there aspects of it where you felt like, "I'm really tempted to say something about this that's not completely within my purview as an economist." But you felt like, "that's just a stupid way to do it; why don't you do it this way?" Were there times or instances where you felt that way?

09-01:37:35
Tolley: Maybe, but I must've suppressed them. [both laugh]

Burnett: So you profoundly internalized the civil service ethos that—. Okay, okay.

09-01:37:49
Tolley: Well, we talked about this a little bit before. When you come down to cleaning up the environment, you need to pay attention to the locational differences. The political situation will not recognize that. The congressmen are too wedded to their own constituencies to think about the idea that you would do something that might threaten that. I guess we talked about that.

Burnett: Yes.

09-01:38:22
Tolley: But you just say it, and it's not politically incendiary, so—.

Burnett: Right. Are there basic economic lessons that you wish everyone be could just understand? If you could turn a switch and overnight, the public would be convinced of this or that economic wisdom, what would be some lessons that you wish you could convey to people?

09-01:38:50
Tolley: Pay attention to the benefits and the costs. Seriously, I think that's important. I talk a lot about benefit-cost analysis. Benefit-cost analysis is a terribly imperfect tool, and you can't expect magic answers. But it really is good at weeding out the dogs. If you see something that's so completely terrible, it's much more difficult to get that through any kind of political shortcomings. I'd have to think about your question for a few days. [laughter]

Burnett: But I think we've already kind of broached a couple of things, like a federal minimum wage — bad idea.

09-01:39:41
Tolley: Bad idea, right.

Burnett: Okay. And saying nuclear power is not cost effective overvalues the initial startup costs and ignores the long-term stability and low-polluting effect of nuclear energy, compared to just about anything else we have.

09-01:40:02
Tolley: Yes, yes.

Burnett: Okay. There's two right there.

09-01:40:06
Tolley: Okay, yeah.

Burnett: With respect to health, people value health a lot more than we think they do. And the valuation of health is a lot more complicated than we thought it was. Maybe we can have a general axiom about that. Any social policy involves a lot more complex forces than we think they do. So a single solution is rarely an unalloyed benefit.

09-01:40:49
Tolley: Maybe so.

Burnett: Yeah, okay. Except for federal minimum wage. We know that one.

09-01:40:53
Tolley: Right.

Burnett: We can figure that one out. So keep that in mind as we're sort of going on through. Going back in time, I suppose, "give me the right price for my farm products. I want *x* dollars, based on my purchasing power in 1914."

09-01:41:15
Tolley: Well, that's ridiculous.

Burnett: But it wasn't for decades.

09-01:41:19
Tolley: True.

Burnett: It was not considered ridiculous; it was considered to be *the* most hallowed and sacrosanct policy—

09-01:41:29
Tolley: Parity, right.

Burnett: —in the United States. The parity price, yeah. To some extent, there's a tiny sliver now of farm policy that has that parity element to it; but it got changed to a rolling average, thanks to T.W. Schultz and a couple other people. But a rolling average is still what you're looking at. So we are looking at, at least from the perspective of California, regardless of how much you defend and subsidize coal, we are looking at some kind of energy transition, not an overnight transition to renewable. That's not in the cards. But your consulting group and you as a researcher were involved in looking at some of the cost aspects and the timescale for this energy transition. The first hydrogen vehicles are out now.

09-01:42:35
Tolley: Oh, yeah, they've been out for a long time.

Burnett: Well, the major car makers now have these models out.

09-01:42:40
Tolley: Right, but they've been available at $100,000 for a long time. But they're beginning to come down now.

Burnett: So that's what you were referring to when you were talking about the neglect of the price component?

09-01:42:53
Tolley: Well, partly, yes.

Burnett: But some of these things are becoming quite cost-effective. There's an infrastructure element to it, as well. The tie-in with nuclear energy is that hydrogen vehicles can be powered indirectly by nuclear power plants and you could have a complete zero-emissions chain.

09-01:43:17
Tolley: Maybe so. We did not work on that part of it.

Burnett: Okay.

09-01:43:20
Tolley: But that's very interesting. We didn't work on that problem.

Burnett: So there is a component. Same with electric vehicles, I suppose. If your grid were powered by nuclear and you have an electric vehicle, then you're looking at a zero-emissions chain for your transportation system.

09-01:43:36
Tolley: Well, all right. No, no question.

Burnett: So this is something that—.

09-01:43:45
Tolley: While we're on this topic, this is a side comment. PG&E, they've flipped over. They're pushing energy conservation and these innovations. Peter Griffiths, I just learned, he's been in energy on the West Coast. I think he is head of their pricing section right now, and he is an outstanding economist. I'm sure he'll do a good job for them.

Burnett: Is he a Chicago product?

09-01:44:26
Tolley: Yeah, he's a student of mine.

Burnett: He's a student of yours. Okay. That's great. So another thing that's relevant to 2018, in the 2008 *Effects of a Transition to a Hydrogen Economy on Employment in the United States*, one of the big insights of the model of the Hydrogen Fuel Initiative is that if you're looking at the transition of building the infrastructure for hydrogen energy and the changes in the automotive industry, you're looking at an additional 675,000 jobs by the middle of the century, with some job replacements; but basically, a net gain. So the notion that you're going to lose all of these jobs in, say, coal, is wrong. The coal industry, of course, is 65,000 jobs across the country; it's not as big an industry as you might think. So one of the insights of this report is that there's going to be a net gain, possibly a significant net gain, from undertaking new technological shifts. That's one of the things that economists study, these really significant, step-wise, innovatory leaps that change the entire nature of the economy, going back, basically, to steam. So in a lot of the debates on efficiency and equity, for the economist — talking to you, talking to Lester Telser, talking to Al [Arnold] Harberger and George [P.] Shultz — if there's a kind of message, there seems to be a message of, "don't worry," in a sense. I don't mean to be facetious. I think I am fairly serious, in the sense that if you accept a rapidly changing technology-driven economy, there are costs associated with it. There are always costs of adjustment and there are winners and losers. But you need to pay attention to the numbers and look at the net benefits over a significant amount of time. Let things roll out. What we explored a lot with both Al and George P. Shultz was these lags. So you have a policy implementation or a technological shift, and overnight, things don't necessarily change. But it takes a while for things to work out economically and for adjustments to be made.

One of the, I suppose, criticisms that's leveled by other economists and analysists — let's take the international development domain — is that there are individuals in any society who are unable to exercise their full market power, let's say. That's the insight of Amartya Sen, for example, when he was writing about food production. If there's a question of malnutrition, poverty, starvation, that kind of thing, in a particular society, the answer has always seemed to be, well, we need to increase the supply of food, and so we need to increase food production, so we have a Green Revolution and we need another Green Revolution. This is routinely the advocacy of Monsanto or this or that booster of technological innovation, saying it will eventually result in this availability of food, which will drive the price down. The point of economists such as Amartya Sen is that in some of those cases, in many of those cases, there are people who are so poor that they exercise no effective demand at all. They just aren't in the market. So A, is that true? Do you accept that as an assertion? And B, if it's true, how do you let the market operate? That's what I've always actually wondered about *Transforming Traditional Agriculture*. T.W. Schultz was saying, you need to price things so that you can get the farmer who is on the cusp of modernizing operations to do so. So right at that margin, how can you key your policies so that they're able to take advantage

of the new technologies that are coming online? But then there's this other category of people who are just outside of the market. They're the dollar-a-day folks or less-than-a-dollar-a-day folks. So A, is that a true economic problem? B, what's the market solution for that population? Is it to say, well, we need to just keep reaching down to encompass that, so that everyone is involved in market activity?

09-01:51:00

Tolley: Well, my first question is, many of these dollar-a-day people are farmers, especially in LDCs, most of them are. Or recently, most of them. So they will automatically, I think T.W.'s basic thing is that farmers respond to incentives. If there are these profitable innovations, farmers will adopt them. So I'm not sure — of course, I'm biased, probably — I'm not sure I'm convinced that it's an important problem. Do we need redistribution policies? I'm sure we do. So that's another part of it. I would see it as a big problem to be looked into, and not necessarily just assume that it's—. It's too easy to conjure up an example of this kind and say, gee, that's the whole problem.

Burnett: Right.

09-01:52:10

Tolley: So at this moment, I'm not convinced. But again, I may be biased.

Burnett: No. It *is* a conjured example. There's obviously a lot more sophisticated research into [this problem of rural, agrarian poverty]. And this is [drawing from] old Amartya Sen from that time.

09-01:52:26

Tolley: Oh, yeah?

Burnett: But that was some of the pitched battle between the Chicago agriculture group and like-minded folks, and the Raúl Prebisches and the Arthur Lewis camp that were saying there was a special economics that's required because unlike farmers in most of the United States, these farm laborers are not even meeting their basic minimum nutritional requirements. So an efficiency wage is required to get that extra productivity out of them. So there's a biological limit to what's happening there. That's just one example. So there're many examples of special agricultural economics that is keyed to what they see as a kind of market failure. The [T.W.] Schultz-D. Gale Johnson-Tolley approach is: The market's everywhere. The market is at least always potentially there, and operates according to market forces. So even if you were to — and this is purely a kind of speculative, imaginary case study. Let's say there is this population that is not in the market. It's just bartering; they're eating the fruit from their land and that's how they live, and they don't trade anything to anybody, and they don't purchase anything from anybody. Really, they're just kind of outside of the market. How you would act on that group to improve their situation is to recognize them as agents in a potential market, at least, and to approach it that way; instead of saying, there's a specific stratum of society

that is a non-market stratum or is hunter-gatherer or something like that, that there are these special populations that are outside of the zone of the market. Of course, in real life, everything is hybridized. So there's partial subsistence, there's partial market activity, there's household economic activity. There's all kinds of things that can get us well off the rails. But we're just on the larger subject of thinking more globally about the impact of Chicago economics and the limits of it, if there are limited applications of that type of thinking, or if it's just a sense that the critics or the opponents have it wrong. They don't really see what you're focusing on, that you're actually focusing on measurable improvements. You're looking at specific instances and testing them and developing models that explain how people actually behave in the world.

09-01:55:56

Tolley: Well. Let's see. In the first place, where are these people? I'm sure T.W. and D. Gale have probably studied [this more]. I studied Korea, mainly, and Japan and certain places like that. I don't see these. Everyplace I go, I see people are engaged in markets. They're selling something. They do respond to markets. Now, there may be these cases somewhere, but I have a little trouble. They may be in Africa. Probably if anywhere, they're probably there. They might be in parts of India; I don't really know. But there's such an incredible variety of specific situations.

Burnett: Right. Certainly, my experience in West Africa is that people are hyper-engaged in market activity, from morning to night. There's tremendous entrepreneurial drive in a lot of these countries. So the last piece of that energy side of the work that you were doing for RCF is the Department of Energy report that comes out in 2010. It's *Hydrogen Production and Delivery Infrastructure as a Complex Adaptive System*. DOE wanted to have a macro model for a total system transition. How do we transition to a hydrogen economy? The solution, in an interim report that was published in 2005, is that you need to study an industry as a complex adaptive system with an agent-based modeling and simulation technique. The definition of a complex adaptive system is that it's a dynamic system that is more than the sum of its parts. I wanted to ask you a little bit about developing this. Well, without being so specific about that particular report, let's have meta-discussion, or allow you to put on your teacher hat and discuss a little bit about the modeling, or the evolution of the modeling of uncertainty. Have we made progress in the development of models [under conditions of uncertainty]? We talked about risk in the valuation of health. How do you transition to an economy that we don't have yet? Have we got better tools now for understanding uncertain unknowns?

09-01:59:00

Tolley: I think we're making a certain amount of progress. Let's see. I'd like to go back to agent-based modeling. That is a so-called alternative. In many ways, it is. Usually, the economists will sum up all the buyers and all the sellers and

have demand and supply curves. The agent-based modeling says, no, all these people are different, so you need to model each one separately. That's what the agent-based modeling is all about. It's a fascinating area, and the guys at Argonne are very interested in it. So that's one thing. It would be interesting to me to study it further. This was a very limited model. Then we find out—I hate to say this, but it's true — the agent-based model. Is there a Santa Fe Foundation?

Burnett: Yes. The Santa Fe Institute?

09-02:00:12
Tolley: Something like that. [interview interruption] As with many of these things, people think, oh, well, this is an alternative to the traditional economics, therefore it will destroy the free market. I'm putting that a little strongly, but I think the Santa Fe Institute has a lot of left-wing people. I don't know what to call them; a lot of anti-market people. So that's a little bit different from the question you're asking. You're asking about, do we know how to handle uncertainty? I predict we're making a little bit of progress. I hope it's not true, but it's going to be quite a while before we make a lot of progress. I think some of the folks here on the Midway are grappling with that. There are models that predict the US economy, for instance. But they're never right, because by the time the event gets here, 2025, the structure has changed; and yet the projections, regardless of the structure, remains the same. So I thought predicting these changes in structure are difficult and not grappled with.

Burnett: Is that a lesson of economics in and of itself? One of the things that Al Harberger was looking at is the step-wise nature of technological innovation and that you can't predict [far in advance]. Everyone had a sense that information was going to be an important feature of the new economy, back when. I don't know if they predicted it would be that important. But we don't know what the next level is going to be, or the next step-wise change.

09-02:02:18
Tolley: Absolutely.

Burnett: I guess if there's an ethos to market economics, is there a kind of evolutionary approach? It's not that you don't plan for the future; it's that you have to accept that you will not know what the future is, and therefore, back multiple horses and have a kind of evolutionary philosophy, with respect to the direction of society? Allow things to unfold with some limited direction as to where a social policy wants to go?

09-02:03:02
Tolley: Well, I think the basic point is the need to recognize that we don't know what the future holds. I don't know whether it's backing multiple horses, or something like that. But what is the optimal strategy in the face of that? People grapple with. I'm not sure we've made that much progress, but we might. But so far, I don't think we have.

Burnett: In a political world, there could be appeals to a Golden Age and there could be, if we can only turn back the clock along this axis, we can then recover something. So you're grappling with that. You're grappling with human valuation, aggregated through voting and through consumer preferences. I think economists are always trying to get a more sophisticated portrait of human behavior, the trends in markets that can sometimes yield surprises. That's one of the big value-adds of innovative economic research — at least with Chicago economics and with economics more generally — is that you need to be prepared to be surprised by the outcome of your research. To go back to ag economics, I guess a role of ag economics, at the top level, was to interpret the sentiments of farmers and to translate it into policy. But the farmers wanted the gold standard. The farmers wanted free silver. The farmers wanted parity prices. They wanted a Golden Age. People like T.W. Schultz and others and you, needed to translate that sentiment and drive into workable economic policy. If the interest on the part of the farmers is to earn a better living, the economist comes back and says, well, "giving you a high price and letting the government foot the bill is not going to do it." The government can help you, but it's going to help you to lower the price. By lowering the price, you're going to sell more, and that kind of thing. So that's just one example. But you can find through your career, that you were surprised by the data. You were surprised by the results of research. Are there particular methodologies, data sets, conclusions that you drew from your research that stand out for you, that you're particularly proud of, that we haven't talked about so much?

09-02:06:18
Tolley: Let me go to my list and see.

Burnett: Well, actually, there's a couple more things we could talk about while we're still in the 2000s. The research that you've been doing on China, you've continued to do that research beyond the reports that we talked about on urban policies or on development. Can you talk a little bit about the research that you've been doing on China in the last fifteen years or so?

09-02:06:51
Tolley: There's several, but I wanted to point out one thing from a previous discussion. Something that T.W.'s not as much recognized for is, he believed in surprises. He thought, it's never going to turn out the way you actually think it is.

Burnett: He believed in surprises.

09-02:07:09
Tolley: Yes. Knowing him over the years, that was a continuing theme of his. So let's see. The China group. The ag workshop kept on for a long time, mainly under D. Gale's impetus. But then there were these China scholars around. Somehow, there was a group of maybe half a dozen of them. I got to meeting with them and we started this China group. Then most of them were around

only for a couple of years. But the China group has kept on, is still keeping on. What about the China group?

Burnett: Did you know Justin Yifu Lin?

09-02:08:08
Tolley: Oh, yeah.

Burnett: Okay. Yeah.

09-02:08:09
Tolley: Was I on his committee? I think I was.

Burnett: You were on his committee.

09-02:08:13
Tolley: Oh, yeah, I knew Justin quite well, actually. He had probably left by that time. I'm sure he had. He went back to China.

Burnett: Yeah, I think he may have come to Chicago in the early eighties, and I think he graduated in'86. Does that sound right to you?

09-02:08:30
Tolley: Probably.

Burnett: He's had an illustrious career. He was chief economist at the World Bank, he's written a bunch of books about China, Chinese agriculture. I think he's at Beijing University now.

09-02:08:47
Tolley: Yeah, he's a major figure in China.

Burnett: A major figure. Yes.

09-02:08:51
Tolley: He comes back occasionally and I see him. But he had left. He was no longer a student. This was a different group. Well, in a way, it was the continuation of the ag workshop. I wouldn't really call it that exactly, but in a way, that's what it was.

Burnett: Can I ask you in what sense it's a continuation of the ag workshop?

09-02:09:26
Tolley: Well, it was probably mainly people who had been or were still working on their theses, and they almost all had to do with Chinese agriculture.

Burnett: Okay, so it's literally about agriculture, but in China.

09-02:09:43
Tolley: Well, it's about rural-urban migration. I want to go back. I don't know where it started, but I've had a continuing interest in depressed areas. It goes back to at least the Appalachian Regional Commission, and probably before that, because it was an interest in the low-income areas, and their depressed areas. Oh, there's William Nicholls. Does that name—?

Burnett: Yeah.

09-02:10:14
Tolley: He and Tony [Anthony] Tang, they were at Vanderbilt. They pushed a lot of this work. So I've been interested in that for a long time. I have a draft of a book like that.

Burnett: Oh, yeah?

09-02:10:34
Tolley: It was at least 700 pages, if not more.

Burnett: Oh, really?

09-02:10:39
Tolley: But a lot of it has to do with why some areas are depressed. If you take any country, almost, you'll find that they have one or more notably depressed areas. So I've been interested in that phenomenon. We took case studies of Italy, several countries around the world, and tried to build an economic model of what drives a depressed economy. The economist wants to know why they persist? If resources are mobile, you'd think it would all even out. But Italy, they haven't. There are many places they haven't. In China, they haven't. They're doing such tremendous change in China. So part of this is coupled with an interest in rural-urban migration. People say the greatest migration in human history has happened in China, but nobody has really measured it. So we developed measures of rural-urban migration. One thing, we were interested, again, should I say the naïve economist would assume that since the eastern part of China is so well-developed and high-income, and the western part of China is so poor, well clearly, the solution is that the people are going to migrate from west to east. So we set out to measure that. As we found out — this was about maybe five years ago; as I say, you can't keep up. Anyhow, at least half of the migration is intra-provincial. So much of the development in China is taking place, if you will, in place, or within the provinces. So we've done a tremendous amount of work on that. We tried to contribute to explanations of why different parts of China are developing at different rates. That's kind of been the major focus of it. Our projections — and the Chinese are doing their own — are that by the year 2040, the Chinese will have caught up with us. They're at $8,000 per capita now? And we're at about $40,000. But they're moving so rapidly that that's our projection. But it might not be. That was two years go. I don't know what it would be now.

Burnett: And then there's purchasing power parity, as well. So by that, it will happen even sooner.

09-02:13:49
Tolley: Well, we try to use purchasing power.

Burnett: Oh, okay, sure. That would make sense. Then in terms of investment in scientific research, they're going to eclipse us within two or three years, which is shocking, right?

09-02:14:02
Tolley: Yes, it is shocking. Do you think it's true? I didn't know. I know they're very able.

Burnett: Well, who knows exactly how it's measured. This was an article in the *Times* a few days ago, saying that, I think by 2020 or 2025, the Chinese will eclipse the United States in spending on scientific research.

09-02:14:27
Tolley: I see. Is this the *New York Times*?

Burnett: Yes. So it does raise questions about how we organize ourselves, when you see such rapid transformation. There's a lot of self-satisfaction, I think, in industrialized countries about, well, we do the right things and we have the most innovative economy and so on. You look at the rapidity of development. If there has been a lot of intellectual property theft and so on, the Chinese themselves realize that they can't rely on US innovation and/or European innovation or anything like that, and they have to develop their own capacity. They have been planning that and developing that for decades. We seem to be a bit asleep at the wheel, by comparison.

09-02:15:35
Tolley: Yes. Well, I certainly agree with you. Of course, this comes back to the key to development of the undeveloped countries, which is not capital; it's knowledge. Really, what we have going on here is a tremendous transfer of knowledge. That's getting to be over and as we get more and more frontier growth. We've done a lot of, quite a bit of study comparing Chinese [development]. The Chinese, in 1978, said the Great Leap Forward and all that didn't work; now let's try something else. So Deng Xiaoping went around and said, "We're going to try some experiments and we'll copy what other people are doing." They, of course, were looking at the US; but they were really looking at Japan and Korea and Taiwan. They said, our sister countries are doing this; we certainly can do it. So he went around and picked out some zones and said, "Let's try some experiments here." Of course, it exploded. In 1978, the whole thing started.

Burnett: Yeah. That was Deng Xiaoping?

09-02:16:59
Tolley: Yeah.

Burnett: Yeah. And you were doing your research in the special economic zones, right? Because that was where the experimental rental housing market—.

09-02:17:10
Tolley: It wasn't really.

Burnett: It wasn't? Okay. Well, that's interesting.

09-02:17:12
Tolley: No, it was—. Yeah.

Burnett: Because it mentions experimental cities.

09-02:17:16
Tolley: Yes.

Burnett: They were outside of—.

09-02:17:18
Tolley: We were not looking at the zones. We would like to have; that's what we wanted.

Burnett: That is interesting. Do you remember what cities, roughly? Or how many cities were being looked at?

09-02:17:31
Tolley: Not that many. Shenzhen is the city that we mainly looked at.

Burnett: Right. Okay.

09-02:17:37
Tolley: But I think in Beijing and, what's the city that's right near Beijing that has the university that you were talking about? But it was not the experimental [city]. By the time we were there, it was fifteen years later or so, and the thing—. China was growing all over the place by now.

Burnett: Oh, okay. I just wasn't sure. I know it was published in '91; I wasn't sure when the research was being done—

09-02:18:09
Tolley: I see.

Burnett: —if it was done a few years earlier. Because if it was a few years earlier, late eighties, it's only—.

09-02:18:16
Tolley: It's only ten years.

Burnett: Only ten years. But ten years is a long time in China.

09-02:18:19
Tolley: Exactly.

Burnett: Okay, fair enough. So the China group, how long does that last? Is it still going, in a sense?

09-02:18:29
Tolley: Well, it's still going. It's very diminished at this point, but it's still going. One that we have been doing, is having the Chinese subsidize free research. If you apply and win the competition, then they'll support you for a year, everything in the United States. So I've been having one Chinese visitor per year here. I have someone here now, probably someone else coming next year. Then we have a few other students involved in it. So anyhow, we were turning out a lot of good material. We've got to get it published.

Burnett: Right. That's phenomenal. You also mentioned that in recent years, you've turned towards the economics of finance. Would you like to talk about that a little bit and what you've been doing?

09-02:19:40
Tolley: Yes, I would. Let's see. There was George Stigler. I remember he was giving a talk, probably at a celebration of Milton's birthday or something like that. He said, "The frontier is information." Of course, he had written a very important article on information, about 1960 or something. So I thought, by golly, he's right. Then I went to the Treasury. We were talking about the Treasury. This is a side comment. I'd forgotten "The Foreign Dependence Question" [article]. But when I was at Treasury in the middle seventies, the oil dependence was a big, big thing. So I started working with John Wilman on this paper of "The Foreign Dependence Question." Then the other thing at the Treasury was that we were talking about valuing assets. We were proposing to eliminate the corporate tax, some rather dramatic thing that they wanted to do. They were referring to the finance literature. It occurred to me they're not taking account of the information requirements in formulating finance theory. So I got them thinking about that, and have worked on it a lot over the years. But just as a side comment, we were talking yesterday. There was the secretary of agriculture who said, "The American people want to live in the countryside." That sparked a lot of interest in what I did in "Welfare Economics of City Bigness" and so forth. So from the Treasury, I got these two important ideas that I worked on. So now how did we get into this?

Burnett: Well, it was a general question about your interest in finance, that continues more recently.

09-02:21:57
Tolley: Yes.

Burnett: I think what you're reiterating is the organic connection you have to the policy world. That you have spent some key moments in your career, at the Office of Tax Policy.

09-02:22:16
Tolley: That was Treasury, yeah.

Burnett: Then there was the time in '64-65 at the USDA and the ERS.

09-02:22:22
Tolley: Right.

Burnett: But beyond that, there's this concern with helping the state to think. I think that's what you do.

09-02:22:42
Tolley: Yes.

Burnett: You help the state to think through problems that now the state is charged with. Now Nixon says, "the Environmental Protection Agency, I'm calling it into being, now go." There's a panic around what they do, what the consequences of what they suggest they would do would be, and they need help. You have been there for decades, through the conduits of Argonne [National Laboratory]; either that or directly involved in government; or you've thought of yourself as an economist who trains future policy advisers, policy makers, politicians, bankers, that kind of thing, much in the same way that Al Harberger does. Al Harberger often sees himself not as training economists who are going to be academic economists, but economists who are going to train other economists in government, or who are themselves going to be active in government. So there's this kind of civic public service aspect to it, although you're at a private research university. But there's a reason: The lineage from T.W. Schultz. He came here because he could not have the freedom to write what he thought at Iowa State. As a direct public civil servant, he was vulnerable. People asked for his resignation repeatedly, and he felt the university could not protect him. So he came to Chicago for that reason. D. Gale Johnson was in the same boat; Oswald Brownlee was in the same boat; Margaret Reid was in the same boat. They all came because of that kind of original experience with political pressure. And you had it in your life. Your own father.

09-02:24:39
Tolley: Right.

Burnett: But you felt a kind of call. From a position of insulation from direct political pressures, you wanted the freedom to give the best advice that you could give, according to your own compass.

09-02:25:00
Tolley: Well, thank you. I would say that's true.

Burnett: Yeah, it seems to be. That seems to stand out, if you look at it from a distance, historically, what is in play there. But more recently, in terms of finance work, there are some of those questions of "The Economics of City Bigness." Are you working on things in the 1990s and in the 2000s and in the last ten years? Are you working on finance questions?

09-02:25:32
Tolley: Well, there's finance theory. Let's see. It began with Harry Markowitz. I don't know if you're into this at all. He was kind of the foundation of modern finance, and properly so, because he pointed out the simple fact that if you diversify, you reduce your risk. However, the people who took up that message said, well, if diversification is so good, you need to do it all the way. So you need to hold a portfolio that contains every stock. So I said a very simple thing. Diversification is fine, but you have to devote effort to investigating these stocks. If you introduce that simple idea, you really quite completely change portfolio theory and asset-pricing theory. So I've been working on that idea off and on, and sometimes very much on, for years, since I was in the Treasury. So then this is my grumble. I can't get my colleagues here at the economics department to accept it, because they are so wedded to this initial idea. I guess they have so much professional investment. Anyhow, I can't get them to accept it. But I'm forging on. So I'm in the middle of working on this and submitting it to other places.

Burnett: Are you finding that it is a cost? You spoke about ag economics. The ethos is you go out and you talk to people who work in that industry. Are you doing the same thing for finance? Are you looking at different forms of brokerages and trading floors and that kind of thing?

09-02:27:33
Tolley: Yes. I probably should be doing it more, but yes, I'm definitely doing that. I'm finding my ideas are corroborated.

Burnett: Okay. You're getting confirmation.

09-02:27:43
Tolley: Yes, yes.

Burnett: Yes, as you go through it.

09-02:27:45
Tolley: Yeah.

Burnett: Are you following some of the transformations of the financial world? That there's some possibly justifiable hand-wringing about the large dark pools that are not subject to the regular sort of trading rules. Automated trading, so algorithms that trade for people, at such a high rate that it approaches — there's this race to sort of have a direct microwave connection between the New York Stock Exchange and these data centers right near here. They're

trading so fast that they're actually accurately predicting price changes, and that there's a whole question of them driving price changes as a result. So there's a whole burgeoning literature about something that is fairly new, and a lot of people regard as quite dangerous. So does this speak to that at all in some ways?

09-02:28:51
Tolley: It would, but I'm frankly not into that. This is, in some sense, a much simpler idea.

Burnett: Well, so one of your students talked about political common sense. You have this political common sense, that you understand, not in an abstract theoretical sense, but what would this look like in practice, pragmatically? There's a practical problem with the diversity of portfolios, for example. So this is something that's another way that you approach it, just in terms of your basic animus in how you approach things. So yeah, so I think we are at a point where we could talk about this question of important articles that are important to you. We covered almost all of them, I think. Do you have your own list here?

09-02:30:26
Tolley: Well, I have a list. I think we've done—

Burnett: We've talked about "The Economics of City Bigness." That's a very, very well-known and cited paper. "The Foreign Dependence Question" is what you were talking about when you were at Treasury.

09-02:30:49
Tolley: Right.

Burnett: That comes out in 1977, in *The Journal of Political Economy*. It is about the economics of stockpiling, because there was this—. The [Strategic] Petroleum Reserve, is something that comes into being, as a consequence of the OPEC crisis. They never wanted to be caught short again.

09-02:31:09
Tolley: Right.

Burnett: But you conclude, contrary to that, that stockpiles are not economically necessary. Why is that? What was the story there?

09-02:31:27
Tolley: I have to go through the whole ball of wax.

Burnett: Okay.

09-02:31:30
Tolley: I wish I could remember. But it is. You have a storable commodity, and it costs you to store it, and there's a certain probability that you're going to use

that stock. I suppose the probability is small enough so it's not worth bearing the cost. But I frankly don't recall it.

Burnett: That's the gist of it.

09-02:31:57
Tolley: Yes.

Burnett: That actually got a fair number of citations.

09-02:32:08
Tolley: Well, let's see. I don't know why I didn't mention this. "Consumer Demand Explained by Measurable Utility [Changes]." That's something that should be of interest to economists, for theoretical reasons. I just wanted to point out that I developed that with a student at NC State, at some point.

Burnett: "Consumer Demand for Measurable Utility."

09-02:32:31
Tolley: "Consumer Demand Explained by Measurable Utility." The received wisdom, at least among Anglo-Saxon English economists — you probably know more than I do — and the continental.

Burnett: The continental ones, yes.

09-02:32:51
Tolley: Yes. So the continental ones, they're not bothered with this. They think you can measure utility. The English economists recognized, quite properly, I believe, that you can't. It's ordinal. You can rank things. We figured out a way so that you really can, if you're a little clever about it, measure the percentage change in utility. Anyhow, so I just wanted to point that out. "Optimal Water Allocation" ["Optimal Water Allocation: The North Platte River"], you said that we discussed that.

Burnett: We did discuss that a little bit. On the North Platte River.

09-02:33:31
Tolley: Yes, right.

Burnett: Yes. That came out in 1960, I think.

09-02:33:36
Tolley: Very early, that's right.

Burnett: Yeah.

09-02:33:39
Tolley: There was a few names I haven't mentioned. There was Steve Hastings. He had been in the Navy, in the Naval Academy and all of that. But he was then

retraining at the University of Chicago, and he worked with me on the T.W. Schultz project about natural resources in the West. So we got very interested in the water allocation problem. He and I and another guy, Cecil Haver, we started out from Chicago and traced the value of water in the North Platte River. People have talked about saleable water rights; but we were talking about the fact that there was a big seasonal component. You store the water, as you probably know, in the mountains, or the snows; and then in the summertime. Anyhow, then what are the marginal values of that? Apparently, nobody had even thought about the problem in that way.

Burnett: How was it thought about, the water allocation in California? There are water rights, and you're entitled to either a certain amount or you have a blanket access to as much water as you can stand to draw.

09-02:35:06
Tolley: Yes, right. All of that. Well, that's the way it's done, which is not completely absurd, but it is kind of absurd. So we said, let's just look at a stream there, the river. What is the value of an acre-foot of water?

Burnett: Right here.

09-02:35:25
Tolley: Yeah.

Burnett: Right.

09-02:35:26
Tolley: And so we traced the North Platte River from the time when it goes up the Missouri or something, up until the hinterlands, and we wrote this article about it. It was very timely. At that time, people were talking about fixing up the leaks in the New York City water system and so forth. We were talking about the value of water. So anyhow, I think it was an early original contribution to that, that's why I'm trying to say that. Let's see. Well, I guess we've covered "The Supply of Farm Operators." Well, that was in that red book[2] that we put back there, and with Warren Johnston, who was a student there at NC State. I was trying to connect up technological change with the human input. I discovered, from tramping around those farms in North Carolina for the first couple of years, that if you sample just a couple of farms, you can get an extremely good idea of what was going on. So a number of graduate students went out to New York State and Iowa, other places, and found out what was going on, and then related that to the managerial requirements. Of course, all over the place, there was the new technology. We were hiring able operators and the whole management-input thing.

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[2] G.S. Tolley, ed. *Study of US Agricultural Adjustments*, Raleigh, N.C.: Agricultural Policy Institute, North Carolina State University, 1968.

Burnett: Right.

09-02:37:13
Tolley: So it was hooking up the management, human side of this to the technological side. I honestly still don't think that that's done sufficiently.

Burnett: We haven't yet figured it out, and it's so central to international development; it's so central to our understanding of an advanced agricultural economy, the migratory features of modernization, of people moving out of agriculture. A lot of our rural development problems. We still have these lagging areas. So we still don't understand that relationship between technological change, human capital investment, human mobility, and capital on the farm. We haven't put that all together yet.

09-02:38:07
Tolley: That was what I was interested in doing.

Burnett: Now, when you talk about sending graduate students out to New York State and Iowa and other places, this is work that was done at NC State?

09-02:38:23
Tolley: Yes, right.

Burnett: Before you came to Chicago.

09-02:38:25
Tolley: That's right.

Burnett: But the publications, the work is being done, they're probably doing dissertations about this.

09-02:38:32
Tolley: Yeah.

Burnett: Then it gets into a publishable form, so they actually come out in articles in '68 and '70. So '68 is "The Supply of Farm Operators?"

09-02:38:42
Tolley: Yes.

Burnett: Which is related to what you're talking about. And "Management Entry Into U.S. Agriculture," in 1970. So those are the two papers that really introduced the complexity of the ideas that you were talking about.

09-02:38:55
Tolley: Yes.

Burnett: "Supply of Farm Operators," we didn't talk about in such detail. The two methodological contributions that you point out in this paper are the modification of both cohort analysis and income-response studies. So you're

trying to get a finer-grained understanding and break up the age cohorts in a way that's going to tell you something about what's happening, but then also how, within those age cohorts, how people are responding to incentives, and how you measure that.

09-02:39:34
Tolley: Right.

Burnett: There are key pieces. So I'm just going to say this and you can interpret it for me, because I don't have the sophistication. But it's an iterative procedure, where there are least-squares estimates for ratios of age-group response coefficients, so that relative incomes are estimable down to a logarithmic transformation. That's the methodological innovation that you're undertaking in this article. But what's interesting is that you do a deep dive into something that for many people—Ted Schultz, for example—was a pretty undifferentiated, unalloyed good: That people were leaving the farm to seek better opportunities in non-farm situations in the cities. What you do is you break it down by age cohort. So some people go and some people stay. One of the things you noted was that non-farm income is becoming more and more important. And that's true today. I think the non-farm income is the most important income for farmers.

09-02:41:03
Tolley: Right.

Burnett: That's an interesting feature that enabled the family farm to continue. Members of the family become accountants, and that's why you have Mutual of Omaha and places like that, right? It makes sense. But one of the things you pointed out in this article is that it's racially differentiated. So African American sharecroppers, there's no part-time option for them; they're sharecroppers. You're either in or you're out. So African Americans would migrate wholesale out of the South, get out of farming completely I think regardless of age cohort. I think if they were older, they would just sort of stay.

09-02:41:48
Tolley: Yeah, that's right. That's basically what I argued.

Burnett: Stay and work to the bone. For the whites, the younger folks would take advantage of opportunities, and those reaching retirement would go into a semi-retired state of farming, where they would sort of pull back. But in both cases, they were continuing to apply innovation to the farm, because they were able to afford to do so.

09-02:42:17
Tolley: Right.

Burnett: So that's what you get, is a finer-grained analysis of the farm problem. And it's multi-faceted. There's demographic, racial, economic components to it, and you have to consider all of them. That's what I see as the innovation, notwithstanding the economic technical innovation that I have the barest grasp of. [laughter]

09-02:42:41
Tolley: Well, you've captured the flavor of it fine. Great.

Burnett: Okay, okay. We talked at length about the "Residence Site Choice" [paper].

09-02:43:03
Tolley: I may think of one or two others; I'll let you know.

Burnett: Okay.

09-02:43:08
Tolley: But I think we've covered most of what's on the list here.

Burnett: Okay. Yeah. So I'd like to ask you, from your perspective over your long career, I think it's probably fair to say that economics is the most powerful social science. It has the most reach into the domains of governance. Psychology's powerful, but in terms of the governance of systems, economics is, I think, far and away the most powerful social science. It's changed over time, and economics education has changed. If you were giving advice to someone going into economics today, what advice would you give about having an impactful, meaningful career as an economist?

09-02:44:35
Tolley: Well, this is an important question. I face it all the time, because students want to know where they should go. In the first place, all the major, the big ten universities, the Ivy Leagues, the Chicago, Stanford, your California system and so forth, they're all quite outstanding. Sometimes I think maybe they should go to the business schools, because they are more practically oriented. So many of the requirements in economics, sometimes I feel that economists are trying to emulate the natural sciences. They try to formalize it this way, but it doesn't really fit, frankly. So where are you going to get a fit? It could be the business schools. But I hate to say that because the outlook of the business schools is basically so narrow. Although the rich ones, like the Booth School here, have hired a lot of really fine general applied economists. I don't have any easy answer to what you're saying.

Burnett: I don't think there is an easy answer, except to say—. I think that economics, neo-classical economics, has been trying to emulate the natural sciences for a long time.

09-02:46:34
Tolley: Yes.

Burnett: Arguably, according to some historians, actually at its inception. That it is a kind of thermodynamic model—

09-02:46:42
Tolley: Yes.

Burnett: —that's been appropriated for social behavior. But I get the sense that there is a kind of institutional economics through the backdoor of neo-classical economics at Chicago, at least in the time period that you're there. That the spirit and orientation of the ag group, which was the driving force, in terms of bringing in money, in terms of relationships with outside institutions — with the Ford Foundation, Rockefeller, the federal government generally speaking, NSF, EPA — the list goes on, a lot of it is funneled through that lens of practical assistance to deal with economic problems. So Al Harberger, for example, is not a trained agricultural economist, but that's how he thinks. He was hired into that environment by Ted Schultz. He was working alongside people like you, people like D. Gale Johnson. Of course, there's a whole other bunch of people who are not ag economists. I don't want to oversell this case. But the spirit at Chicago in those decades was definitely to provide useful, workable economic knowledge that you could then act upon. It's not going to be perfectly elegant in an econometric sense, but it is going to be elegant economics that answers some basic questions about how to run something; or how to not run something into the ground.

09-02:48:44
Tolley: Yes. [laughter]

Burnett: I think that's often what you've said, right? Can we just avoid complete disaster by observing some fundamental principles here? I think that's often the policy advice that you give. Thinking back to the Korea case, where you were able to formulate an elegant, relatively simple formula to describe the price policy for Korea. That was impressive. But more importantly, it was useful. On the basis of that, they were able to make some changes that improved their agricultural situation, at least with respect to rice.

09-02:49:29
Tolley: Well, I agree with that, certainly. I often have told my classes that the most important ideas, if you twist them the right way, they're incredibly simple. I think for a lot of economists, there's an incentive to publish these fancy things.

Burnett: So there's a perverse incentive in economic research to make things more complicated than they need to be?

09-02:49:59
Tolley: Oh, there's that. There's that implication; there's that side of it.

Burnett: Okay.

09-02:50:05
Tolley: But there's a lot of good work going on.

Burnett: Oh, of course. Absolutely. Well, Dr. Tolley, I want to thank you so much for taking the time. I'll let you have the last word. Are there other things that you'd like to explore?

09-02:50:22
Tolley: I think that's about it. I would like to point out that I've enjoyed corresponding with my former students. They have told me things that they've gotten out of working with me, and I've appreciated that. I think that's one of the legacies of a teacher. I want to thank you. You've been excellent in posing questions and making me think.

Burnett: Well, you're very welcome. It's been a master class for me, to be able to sit here and ask you about your life and work, and I've gotten so much insight into things. I did want to ask about family. We haven't tracked that so much. Can you tell me about kids, grandkids? Can you fill us in on that a little bit?

09-02:51:14
Tolley: Let's see. Well, really we're a time-extended family. Alice and I didn't get married till we were about forty. Then our daughter Catherine didn't have kids until she was almost forty. So we were blessed with two wonderful grandkids, five and eight years old, and we're enjoying them tremendously. I have two older brothers who have passed away now. They were economists.

Burnett: Yes. One at USDA.

09-02:51:56
Tolley: Yes, and the other at the World Bank. So that's about it.

Burnett: Well, that's wonderful. Well, this has been a real document for the history of economics and the history of public policy, the history of environmental issues and environmental science, the history of urban policy, the history of health, public health, and health economics and policy, and the history of agriculture and international development. So I think we've covered a few bases here. I wish we had twenty more hours to flesh some of this in more detail.

09-02:52:48
Tolley: I do, too. I would like to say, I was a kid in Berkeley for a while. It was close, whether I was going to have my career in Berkeley or here.

Burnett: At a couple of times, right?

09-02:52:59
Tolley: Yes, right. Anyhow, it's been great. I've enjoyed it.

Burnett: Wonderful. Thank you.

[End of Interview]

Narrator Addendum

I feel a need to add a page attempting to list contributions to the field of economics that have tended to get lost in the public policy details of the narrative as it stands.

a. Research on consumer demand explained by measurable utility changes

b. Providing for growth of the money supply via a tax on money

c. Introduction of the concept of amenities into urban economics and more generally as a topic of concern in economic analysis

d. Introduction, a generation ahead of others, of labor supply and migration into regional economics, making regional economics a part of mainstream economics

e. Provision of a definitive framework for evaluation of health improvements

f. Disentangling of the interdependency of income and education

g. Analysis of the probability of disruption of foreign energy supply on national income

h. Reformulation of portfolio theory to explain the fact that investors hold several assets instead of holding the market

There is also the reorganization of the ERS of USDA to resurrect the parts of the BAE that were gutted in H.R. Tolley's time, and the poetic justice of putting his son in charge of it. The resurrection was not complete—it did not include Jess Gilbert's "third New Deal"—which I would not have wanted it to—but it featured a strong emphasis on rural poverty which had been a major object of the gutting.

CURRICULUM VITAE
George S. Tolley, Ph.D.

Education

Ph.D., Economics, 1955, University of Chicago M.A., Economics, 1950, University of Chicago B.A., Economics, 1947, American University

Positions

President, RCF Economic and Financial Consulting, Inc, 1978 to present Professor Emeritus of Economics, University of Chicago, 2000 to present Professor of Economics, University of Chicago, 1966–2000

Visiting Lecturer, Nankai University, China, Spring 1995

Director, Center for Urban Studies, University of Chicago, 1977–1985

Deputy Assistant Secretary and Director of the Office of Tax Analysis, U.S. Department of Treasury, 1974–1975

Visiting Professor, Purdue University, 1970

Director, Economic Development Division, Economic Research Service, U.S. Department of Agriculture, Washington, D.C. 1965–1966

Visiting Professor, 1962 and Visiting Scholar, 1971–1972, University of California at Berkeley

Associate Professor and Professor, North Carolina State University, Raleigh, 1955–1966
Assistant Professor, University of Chicago, 1950–1955

Honorary Doctorate

North Carolina State University, 2006

Co-Editor

Resources and Energy Economics, North-Holland professional journal, 1978–1998

Honorary Editor

Resources and Energy Economics, North-Holland professional journal, 1998–present

Honorary Fellow

Weimer School of Advanced Studies in Real Estate and Land Economics

Member of:

Faculty for East Asian Studies of the University of Chicago, 1997–present
Advisor to Commissioner of Environment of the City of Chicago, 1998–1999

Faculty of Environmental Studies Program of the University of Chicago, began 1994

Board of the Center on Aging, Health and Society, University of Chicago, began 1987

Board of the Center for Urban Research and Policy Studies, University of Chicago, began 1985

Energy Engineering Board of the National Research Council, 1984–1990

Committee on Public Policy Studies of the University of Chicago, 1975–1986, and Co-Chairman of its Resources Group

Environmental Simulation Modeling Advisory Committee of the United States Scientific Committee on Problems of the Environment, 1975–1976

Advisory Board on Water Resources Planning to the Government of Iran, 1974
Committee on Automotive Pollution of the National Academy of Sciences, 1974
Faculty Advisory Committee for Argonne National Laboratory, began 1972
Editorial Board of the Journal of Urban Economics, 1975–1992

Program Committee of Illinois Institute for Environmental Research, 1971–1976
Inter-University Committee on Urban Economics, 1968–1980
Vice-President, American Farm Economic Association, 1965–1966
National Academy of Sciences Committee on Water, 1965–1969
Executive Committee of Agricultural Policy Institute, 1961–1966

National Study Group on Benefits and Cost of Government Programs, sponsored by the Farm Foundation, 1961–1963

Committee on Agricultural Economics of the Social Science Research Council, 1961–1965

Southern Land Economics Research Committee, 1957–1965

Consultant to:

World Bank, 1971, 1976, 1979, 1984, 1986, 1988, 1989, 1990, 1992

U.S. Agency for International Development, 1970–72, 1976–77, 1987, 1991, 1993

Minister to Planning of Venezuela, 1977–1979

Minister of Planning, Panama, 1975

Department of Housing and Urban Development, 1974

U.S. Commission on Water Quality, 1974
Chicago Housing Authority, 1971
University of Puerto Rico, 1967–1969
President's Commission of Rural Poverty, 1967
Appalachia Commission, 1965
Office of Science and Technology, 1964
Civil Rights Commission, 1964
Center for Regional Studies at the University of Pittsburgh, 1964
Water Resources Research Center of the University of California, 1963
Federal Reserve Bank of Chicago, 1962

Professional Association Memberships

American Association for the Advancement of Science American Economic Association
American Agricultural Economics Association Econometric Society
International Association of Energy Economists

General Academic Contributions

Dr. Tolley has made important original academic contributions. He is a pioneer in the areas of Environmental, Urban, and Energy Economics. Among his many accomplishments, Dr. Tolley long has been an internationally recognized leader in the development and application of techniques for measuring costs and values that are determined outside of conventional markets. He has applied these techniques to the valuation of environmental amenities and costs, urban housing values, value of life and medical treatments, among others. He has used such estimates successfully in court cases and regulatory proceedings.

Dr. Tolley's published works include over 22 books and over 50 articles. Among the journal articles, four were published in Econometrica, three each in the Journal of Political Economy and the American Economic Review, and one in the Quarterly Journal of Economics. He has participated in the preparation of 25 monographs and technical studies, over 80 chapters contributed to books, conference proceedings, and other research studies, and has written 11 book reviews and made a number of published remarks as a professional meeting discussant.

List of Publications

0. Books

SINCE 1980:

0.24 Hydrogen Production and Delivery Infrastructure as a Complex Adaptive System. United States Department of Energy, 2010. (Donald Jones and Argonne National Laboratory, co-authors.)

0.23 Effects of a Transition to a Hydrogen Economy on Employment in the United States: Report to Congress. United States Department of Energy, 2008. (Argonne National Laboratory, co-author.)

0.22 The Economic Future of Nuclear Power. United States Department of Energy, 2004. (Donald Jones, co-author.)

0.21 Urban Land and Housing Reform in Socialist and Formerly Socialist Countries, co-editor. Mt. Pleasant, MI: The Blackstone Company, 1996 (Shouyi Hao and Marcia Occomy, co-editors.)

0.20 * Valuing Health for Policy: An Economic Approach, co-editor. University of Chicago Press, 1994. (Donald Kenkel and Robert Fabian, co-editors.)

0.19 Technical Change & Income Distribution in Indian Agriculture co-author. Boulder, CO: Westview Press, 1994. (David Abler and G.K. Kripalani, co-authors.)

0.18 The Economic Value of Visibility, co-editor. Mt. Pleasant, MI: The Blackstone Company, 1988. (Robert Fabian, co-editor.)

0.17 The Economics of Urbanization and Urban Policies in Developing Countries, co-editor. Washington, DC: The World Bank, 1987. (Vinod Thomas, co-editor.)

0.16 Spatial Impacts of Federal Expenditure and Tax Policy, co-author. Mt. Pleasant, MI: The Blackstone Company, 1986. (Ronald Krumm and Ricardo Garcia, co-authors.)

0.15 Housing Dynamics and Neighborhood Change, co-editor. Mt. Pleasant, MI: The Blackstone Company, 1986. (William Shear, co-editor.)

0.14 The Economics of R and D Policy, co-editor. New York, NY: Praeger Co., 1985. (James Hodge and James Oehmke, co-editors.)

0.13 Environmental Policy: Solid Wastes, vol. 4, co-editor. Cambridge, MA: Ballinger Publishing Co., 1985. (Joseph Havlicek and Robert Fabian, co-editors.)

0.12 Environmental Policy: Water Quality, vol. 3, co-editor. Cambridge, MA: Ballinger Publishing Company, 1983. (Dan Yaron and Glenn C. Bloomquist, co-editors.)

0.11 Agricultural Price Policies and the Developing Countries, co-author. Baltimore, MD: The John Hopkins University Press, 1982. (Vinod Thomas and Chung Ming Wong, co-authors.)

0.10 * The Economics of Urban Amenities, co-editor. New York, NY: Academic Press, 1982. (Douglas Diamond, Jr., co-editor.)

0.09 Environmental Policy: Air Quality, vol. 2, co-editor. Cambridge, MA: Ballinger Publishing Company, 1982. (Philip E. Graves and Alan S. Cohen, co-editors.)

0.08 Environmental Policy: Elements of Environmental Analysis, vol. 1, co-editor. Cambridge, MA: Ballinger Publishing Company, 1981. (Philip E. Graves and Glenn C. Bloomquist, co-editors.)

1970–1979:

0.07 International Science and Technology: The Policy Gap, Editor. Chicago: Council on Foreign Relations, 1979. (James Hodge, co-editor.)

0.06 * Urban Growth Policy in a Market Economy. New York, NY: Academic Press, 1979. (John Gardner and Philip E. Graves, co-authors.)

0.05 Income Support Policies for the Aged, Editor. Cambridge, MA: Ballinger Publishing Company, 1977. (Richard V. Burkhauser, co-editor.)

0.04 Electric Energy Availability and Regional Growth. Cambridge, MA: Ballinger Publishing Company, 1977. (Charles Upton and V. S. Hastings, co-authors.)

0.03 Trade, Agriculture and Development, co-editor. Cambridge, MA: Ballinger Publishing Company, pp. xvi, 218, (Peter Zadrozny, co-editor.)

0.02 * Study of U.S. Agricultural Adjustments, Editor. Raleigh: North Carolina State University Agricultural Policy Institute, pp. vii, 37, 1970.

BEFORE 1970:

0.01 Economics of Watershed Planning, co-editor. Ames: Iowa State University Press, pp. iv, 339, 1960. (F. E. Riggs, co-editor.)

1. Journal Articles

SINCE 1990:

1.60 "Energy and the Environment: Identifying Our Goals," Harvard College Economics Review, Vol. 3, Issue 2, 2009.

1.59 "Utility and the Income Elasticity of the Value of Life," (forthcoming). (Richard Hornbeck, co-author.)

1.58 * "Asset Pricing with Investor Information Costs" (submitted for publication). (Mark Nielson, co-author.)

1.57 "A Cost-effectiveness of atypical antipsychotic medications versus conventional medication," Expert Opinion on Pharmacotherapy, Volume 7, No.13, September 2006. With Patricia Hanrahan, Daniel J. Luchins, and Robert Fabian.

1.56 "Economic Grand Rounds: Allocating Funds for Medications and Psychosocial Interventions: How Consumers Would Divide the Pie," Psychiatric Services, 56(7): 799–800, July 2005. (Daniel Luchins, Irinel Chiriac, Patricia Hanrahan, Morris Goldman, Robert Fabian, co-authors)

1.55 "Child Discipline and Family Decision Making," Journal of Socio-Economics 33(2):153–173, April 2004. (Shaffdeen Amuwo, Robert Fabian, Ardith Spence, and Jacqueline Hill, co-authors.)

1.54 "Plant Level Productivity, Efficiency, and Environmental Performance of the Container Glass Industry," Environmental and Resource Economics, 23(1):29–43, September 2002 (Gale A. Boyd and Joseph Pang, co-authors.)

1.53 "Contingent Valuation and Valuing Children's Health," Valuing Health for Environmental Policy with Special Emphasis on Children's Health Issues. U.S. Environmental Protection Agency Conference, Washington, D.C., March 23–24, 1999. Website: http://www.epa.gov/oppe/eaed/eedhmpg.htm (Robert Fabian, co-author.)

1.52 "The Economic Impact of Reducing On-Base Naval Housing," Contemporary Economic Policy, 18(2000): 345–358 (Peter Bernstein, co-author.)

1.51 * "Issues in Improvement of the Valuation of Non-market Goods," Resource and Energy Economics 20(1998):75–83 (Robert Fabian, co-author.)

1.50 "Health Values and the Rationing of Medical Care." (Submitted to the Journal of Policy Analysis and Management, 1998, being revised for resubmittal). (Robert Fabian and Donald Kenkel, co-authors.)

1980–1989:

1.49 "Technology Adoption and Agricultural Price Policy." American Journal of Agricultural Economics Nov., 71(1989): 847–857 (Tracy Miller, co-author.)

1.48 "The Impact of Asbestos Disclosure Requirements on Real Estate Transactions." NAC Journal Winter 6, No. 4(1988–89): (Kevin Croke, Edward Mensah, and Robert Fabian, co-authors.)

1.47 "Asbestos in Buildings: Effects on Residential and Commercial Real Estate Values." The Environmental Professional 11(1989): 256–263 (Kevin Croke, Edward Mensah, and Robert Fabian, co-authors.)

1.46 "Asbestos Removal and Treatment Impacts on Housing and Urban Neighborhoods." J. Environmental Systems 18(1988–89): 123–131 (Kevin Croke, Edward Mensah, and Robert Fabian, co-authors.)

1.45 * "Regional Economics," The New Palgrave A Dictionary of Economics (1987): 117–120 (Ronald Krumm, co-author.)

1.44 "Valuing Changes in Health Risks: A Comparison of Alternative Measures." Southern Economic Journal 53(1987): 967–984 (Mark C. Berger, Glenn C. Bloomquist, and Don Kenkel, co-authors.)

1.43 * "A Depletable Resource Under International Uncertainty." Resources and Energy 6(1984):205–234 (John D. Wilman, co-author.)

1.42 "On the Effects of Federal Aid." American Economic Review Papers and Proceedings 74(1983): 159–163 (R. Krumm, J. Sanders, co-authors.)

1.41 "Approximate Aggregation and Error in Input-Output Models." Resources and Energy 4(1982):203–230. (Joel C. Gibbons and Alan M. Wolsky co-authors.)

1970–1979:

1.40 * "The Foreign Dependence Question." Journal of Political Economy 85(1977):323–347.

1.39 "Air Pollution and Urban Land-Use Policy." Journal of Environmental Economics and Management 4(1976):247–254. (Alan S. Cohen, co-author.)

1.38 * "Welfare Economics of City Bigness." Journal of Urban Economics 1(1974):324–345.

1.37 "Why is Korea Growing?" The Korean Economic Review, February 1973.

1.36 "The Interdependence Between Income and Education." Journal of Political Economy 79(1971):460–480.

1.35 "Effects of Government Policies on Employment Opportunities for Blacks." American Journal of Agricultural Economics 53(1971):303–315.

1.34 * "Management Entry into U.S. Agriculture." American Journal of Agricultural Economics 52(1970):485–493.

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1.33 "'Solid Wastes' - A Resource?" American Journal of Agricultural Economics 51(1969):1598–1602. (Yi Wang and Joseph Havlicek, Jr., co-authors.)

1.32 "Re-examination of the Time Series Evidence on Food Demand." Econometrica 37(1969):695–705. (Yi Wang and R. G. Fletcher, co-authors.)

1.31 "Mellor on Agricultural Development." Economic Development and Cultural Change 17(1969):254–261.

1.30 "A 1960s Look at the 1930's Policy Proposals of M. L. Wilson." American Journal of Agricultural Economics 50(1968):1191–1194.

1.29 * "The Supply of Farm Operators." Econometrica 32(1968):365–382 (W. E. Johnston, co-author.)

1.28 * "The Residence Site Choice." Review of Economics and Statistics 50(1968):241–247. (R.N.S. Harris and C. Harrell, co-authors.)

1.27 * "Water Resources." International Encyclopedia of Social Sciences New York: Macmillan Company and the Free Press, 1968: pp.77–483.

1.26 "Recreation Projection Based on Demand Analysis." Journal of Farm Economics 48(1966):984–1001. (Wayne E. Boyet, co-author.)

1.25 "Future Cropland Requirements and Projection Sensitivity." Journal of Farm Economics 48(1966):597–612. (W. E. Johnston, co-author.)

1.24 "Future Economics Research on Western Water Resources--with Particular Reference to California." Natural Resources Journal 5(1965):259–285.

1.23 "Strategy for Agriculture in Development." Journal of Farm Economics 47(1965):365–378. (Bruce F. Johnston, co-author.)

1.22 "Mathematics and Statistics in Graduate Agricultural Economics Training." Journal of Farm Economics 47(1965):189–206. (H. W. Grubb, co-author.)

1.21 * "Agriculture and the Secular Position of the U.S. Economy." Econometrica 32(1964):554–575. (Seymour Smidt, co-author.)

1.20 * "Factor Market Efficiency for Agriculture." American Economic Review 34(1964):107–119. (B. M. Farmer, co-author.)

1.19 * "Consumer Demand Explained by Measurable Utility Changes." Econometrica 31(1963):499–513. (R. W. Gieseman, co-author.)

1.18 "Age-Mobility and Southern Farmer Skill - Looking Ahead for Area Development." Journal of Farm Economics 45(1963):31–46. (H. W. Hjort, co-author.)

1.17 "Population Adjustment and Economic Activity: Three Studies." Papers and Proceedings of the Regional Science Association, 11(1963):53–67.

1.16 "Farm Income Policies and Research." Journal of Economics 44(1962):1266–1275.

1.15 "Simultaneous Target Planning for Farms and the Area." Journal of Farm Economics 44(1961):979–991. (A. P. Varley, co-author.)

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1. Affidavit (June 2014) and testimony (August 2016) on behalf of Entergy Corporation, in Christine A. Bostek, et al., v. Entergy Nuclear Generation Co., et al., in Commonwealth of Massachusetts, Land Court Department of the Trial Court, Case No. 13-MISC-479028-RBF, June 2014. Subject: Effects on residential property values of zoning permitting for a proposed independent spent fuel storage installation (ISFSI) at Entergy's Pilgrim station.

2. Testimony (July 2010) on behalf of the Town of Flower Mound, Texas, in The Inclusive Communities Project, Inc. vs. The Town of Flower Mound, Texas, in the United States District Court, Eastern District of Texas, Sherman Division, Civil Action No. 4:08-CV-0433, July 2010. Subject: Methods of measuring housing discrimination in zoning regulation.

3. Deposition (October 2007) and testimony (February 2008) on behalf of City of Kyle, Texas, in National Association for the Advancement of Colored People, Texas State Conference of NAACP Branches and Austin Branch of the NAAACP, Home Builders Association of Greater Austin, Inc, and National Association of Home Builders, Inc. vs. The City of Kyle, Texas, in the United States District Court for the Western District of Texas Austin Division, Civ. No. A-05-CA-979-LY, October 2007. Subject: Methods of measuring housing costs and housing discrimination in zoning regulation.

4. Deposition on behalf of Bank of America, in Gardner vs. Bank of America, Superior Court of New Jersey, Law Division: Atlantic County. Docket No. ATL- L-184-99 and Docket No. ATL-L-256-99, May 2003. Subject: Effects of market for luxury condominiums in Atlantic City, NJ, vs. claims of shoddy construction.

5. Oral presentation in Administrative Hearing of the U.S. District Court for the Southern District of New York in United States of America and Yonkers Branch NAACP, et al. vs. Yonkers Board of Education City of Yonkers Community Development Agency, March 1998. Subject: Effect on economy of Yonkers of tax increases necessary to pay for educational measures related to desegregation.

6. Testimony on behalf of J.T. Baker Company in State of New Jersey Dept. of Environmental Protection vs. J.T. Baker Chemical Company, Superior Court of New Jersey, Chancery Division, Warren County. Docket No. C-6597-87, January 1989. Subject: Effect of delay in environmental compliance on present value of cost of compliance.

7. Testimony for the defendants Village of Grayslake, IL, vs. Unity Ventures in U.S. District Court, No. 81-C-2745 (N.D. Ill. 1984), before Judge Nicholas J. Bua and a jury, January 1984. Subject: Effect of lack of water on subdivision development.

TESTIMONY BEFORE REGULATORY BODIES

1. Testimony (March 2012, November 2012) on behalf of Entergy Nuclear Operations, in the matter of License Renewal Application Submitted by Entergy Nuclear Indian Point 2, LLC, Entergy Nuclear Indian Point 3, LLC, and Entergy Nuclear Operations, Inc., United States Nuclear Regulatory Commission before the Atomic Safety and Licensing Board, Docket Nos. 50-247-LR and 50-286-LR, March and November 2012. Subject: Property values in the area surrounding a nuclear power generation facility.

2. Affidavit and Report on Costs of Clean Coal (October 2011) on behalf of Commonwealth Edison Company, in the matter of the Illinois Power Agency Petition for Approval of the 220 ILLS 5/16-111.5(d) Procurement Plan, State of Illinois, Illinois Commerce Commission, Docket No. 11-0660, ComEd Appendix A, Attachments 01, 02, and 03. Subject: Comparison of electricity costs using clean coal technology vs. other major technologies and resources.

3. Since 1980, have appeared as the chief witness on postal mail volumes for the U. S. Postal Service before the Postal Rate Commission in eight general rate cases and two mail reclassification cases: R80-1, R84-1, R87-1, R-90, R-94, MC95-1, MC96-2, R97-1, R-2000, and R-2001.

4. Testimony on behalf of Johnson County Joint Intervenors, 84-KCPE-198-R/142, 099-U, Kansas Corporation Commission, May 1985. Subject: Effect of electricity rate increase on local economic development.

5. Direct testimony before the Pennsylvania Public Utility Commission for Philadelphia Area Industrial Energy Users Group, May 1981. Subject: Economic impact of financing the construction costs of Limerick through customer contributions during the construction period.

OTHER PROCEEDINGS

1. Testimony on behalf of City of Chicago before Chicago Gaming Commission, May 1992. Subject: Effect of proposed City of Chicago Casino on horse racing.

2. On behalf of Chicago Milwaukee Railroad, in Goose Island zoning proposals before Chicago Plan Commission, October 1990. Subject: Effects on employment and tax revenues of mixed use zoning vs. industrial retention zoning.

3. Testimony before Advisory Commission on Regulatory Barriers to Affordable Housing, July 1990. Subject: Effects of regulations on supply of affordable housing.