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C. Judson King:  
A Career in Chemical Engineering and University Administration, 1963 – 2013

Separation Processes in Chemical Engineering

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Interviews conducted by  
Lisa Rubens and Emily Redman, with Sam Redman  
in 2011

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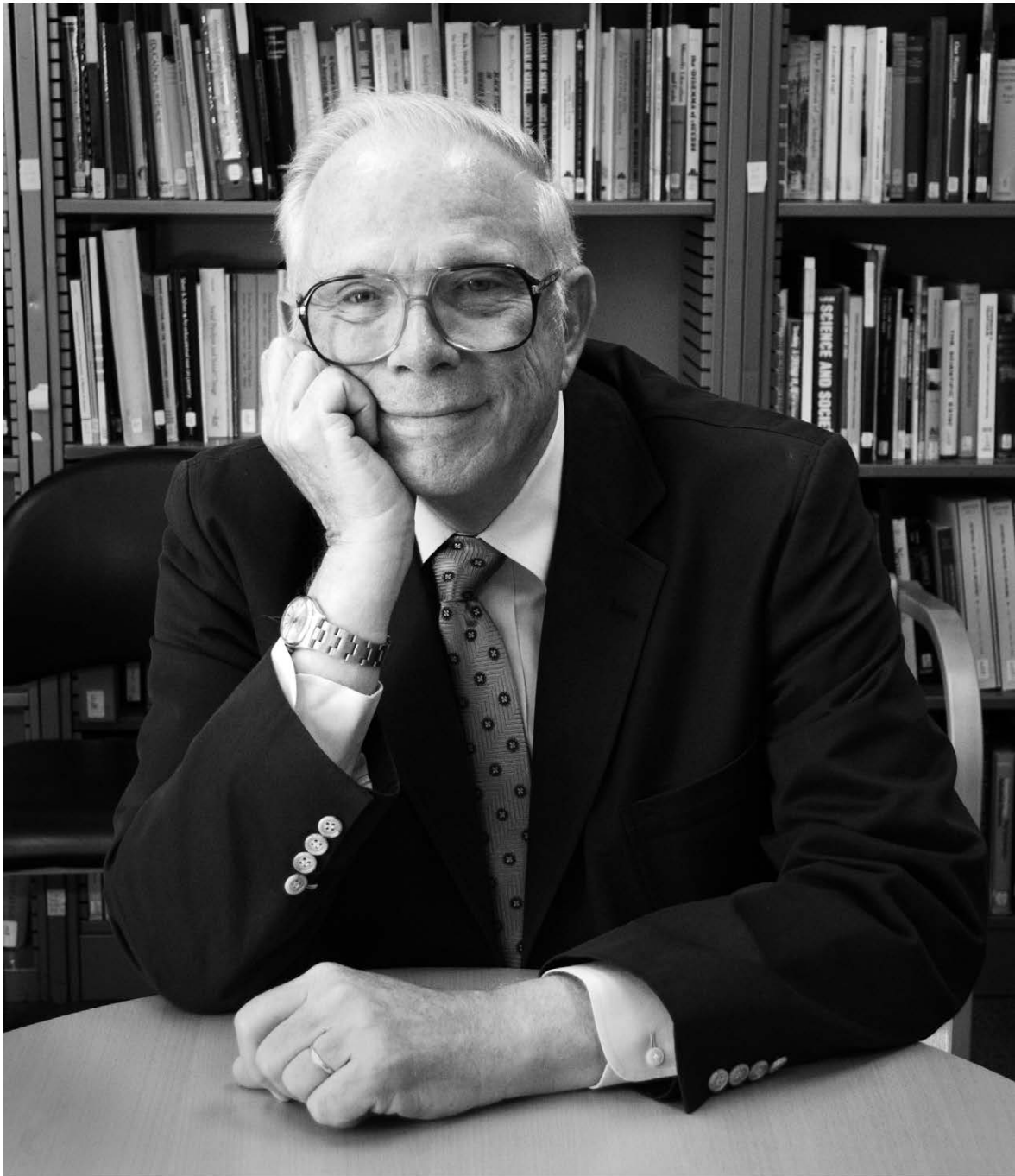
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C. Judson King, 2011  
Photo courtesy of Michael Barnes



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## INTRODUCTION by Karl S. Pister

I met Jud King more than thirty years ago when he became Dean of the College of Chemistry—the first Chemical Engineer to hold that position in a college laden with Nobel Laureate chemists—a sign of things to come. I was Dean of the College of Engineering at Berkeley at the time. In the ensuing years our professional lives have been intertwined in our roles as academic administrators in the University. It is this aspect of Jud’s career and from that perspective that I am pleased to write this introduction. I find Jud’s career quite atypical of Berkeley faculty members, especially those honored by election to the National Academy of Engineering for exceptional work as an engineering scholar. Note, as Jud does in this oral history, the following:

“For some reason, I had always thought administrative things would be interesting...What happened is that as I did it, I found, a) I could do it, b) people liked the way I did it, and c) I liked doing it.”

Now in his fourth decade of still “doing things he liked to do” the high quality and style of Jud’s administrative persona remain unchanged. It cannot be more accurately expressed than in his own words:

“There are plenty of things that have challenged me in all capacities I’ve been in, and even raised hackles, but my natural inclination in such circumstances is to think harder and not let my emotions run away with me.”

I have worked both with Jud and under Jud for three decades and have never seen a raised hackle. In those years there has never been a serious disagreement between us, differences of opinion, of course, but no raised hackles. That is the kind of person Jud is, one of the most respected and trusted colleagues that I have known in sixty years of University service.

The University of California is replete with internationally acclaimed scholars. What is remarkable about Jud is that his accomplishments as a respected engineering scholar and consultant to industry tell only part of the story—they stand beside his truly exceptional service to the University as a senior academic administrator. The remarks that follow focus on this aspect of his career, which I will divide into three phases: Berkeley Campus, Office of the President, and post-retirement years at Berkeley.

It was an indication of things to come that Jud served nine years as Chairman of the Department of Chemical Engineering and only stepped down at the insistence of the Dean of the College of Chemistry, whom he promptly replaced, but not for long as he became Provost for Professional Schools and Colleges. In this latter position Jud had to deal with thirteen Berkeley deans of schools and colleges of widely different cultures and problems. His even-handed style of listening and acting created an academic environment in which excellence was both expected and accomplished. Two examples demonstrate Jud’s creative ability during this period. He was instrumental in the appointment of the first woman Dean of the Boalt School of Law, Herma Hill Kay. His patience in dealing with complex, sensitive issues is represented by his role in overseeing the successful decommissioning of the nuclear reactor underlying the then Etcheverry Hall parking lot—a process in which the Department of Energy, the State of California and the Berkeley City Council were parties intent on complicating the conduct of the work.

I chaired the search committee that dislodged Jud from Berkeley to become Vice Provost for Research in the Office of the President. In making that move Jud displayed a somewhat surprising naiveté in that he “had hopes of improving campus views of OP”. That aside, in short order Jud moved from Vice Provost for Research to Provost and Senior Vice President-Academic Affairs, with a brief period of interim service between two presidents and the departure of the Provost and SVP-Academic Affairs, Walter Massey. The scope of responsibilities of this office is remarkable: OP contact for the University-wide Academic Senate, Academic Planning and Analysis, Student Academic Services, oversight of the UC managed National Laboratories, UC Library, Education Abroad Program, Continuing Education of the Bar, CARA and Keck Telescopes, UC Press, responding to requests of individual Regents, Outreach to the K-12 System. Collateral duties included the California Council on Science and Technology (CCST) and the American University of Armenia Corporation (AUAC).

The ability to effectively multi-task understates Jud’s performance in this high pressure environment. His ability to “think harder and not let my emotions run away with me” once again expresses the quality of his long tenure in OP. From the list of activities for which he had responsibility I will mention only two for which I had direct knowledge from working with Jud for four years in OP. The mission of CCST, established by the California Legislature in 1988, is to provide advice to the government of California on policy issues in which science and technology are key factors. The early years required a significant effort to establish a presence in Sacramento and to be listened to. Jud served ten years on the Council, during the last three of which he was Chair of the Council. In this capacity he had developed the first strategic plan for the Council and he worked tirelessly to establish the integrity and credibility of CCST in the capitol. His leadership and vision were indispensable to the success of CCST’s mission. At the same time by virtue of his position as Provost, he chaired the Board of Trustees of the American University of Armenia Corporation. This institution was born at the sunset of the Soviet presence in Armenia, thanks to the efforts of members of the University faculty, blessed by the Regents and led by the Office of the President in the person of the Provost. His leadership and vision in the early years of the university, was repeated in recent years when he once again accepted the Chair of the Board during a difficult change of leadership of the institution. It is no exaggeration to say that his skill in dealing with people, especially the mutant forms that are often found in the academy, has saved the American University of Armenia more than once in its lifetime.

In 2004 Jud came back home to Berkeley, retired, but not to rest. Our paths crossed once again as he relieved me in taking the Directorship of the Center for Studies in Higher Education. He has brought a new sense of purpose and breadth of mission to the Center, which is now thriving under his direction, especially in focusing on higher education from an international perspective.

Outstanding service rarely goes unnoticed in the University, or no good deed goes unpunished. At the Berkeley Chancellor’s request, Jud acquired the title of Interim Director of the Phoebe A. Hearst Museum of Anthropology. This seemingly benign title conceals the fact that his task was to carry out the repatriation of Native American remains and artifacts in accordance with the Federal Native American Graves Protection and Repatriation Act. His success in completing this brave, as well as grave undertaking, prompted Chancellor Birgeneau to remark, “...I, the Hearst Museum, and the university as a whole owe Jud a great debt of gratitude for this selfless service.”

Selfless service of the highest quality, integrity and consistency in dealing with all constituencies; a calm demeanor and respect for others—these are traits of character that define Cary Judson King.

Karl S. Pister  
Dean and Roy W. Carlson Professor of Engineering Emeritus, UC  
Berkeley  
Chancellor Emeritus, UC Santa Cruz  
Former Vice President-Educational Outreach, UC Office of the  
President

Berkeley, California  
January 2013



## INTRODUCTION by John Prausnitz

During the early 1950s, there was controversy at Berkeley concerning whether Chemical Engineering should be in the College of Engineering or in the College of Chemistry. With establishment of the Department of Chemical Engineering in 1957, that controversy had been decisively settled in favor of the College of Chemistry. Because the Chemical Engineering Department was much smaller, it was the “little brother” of a dominant Department of Chemistry. In research, the intellectual influence of the big brother was strongly in the direction of fundamental science; applications and engineering did not enjoy the same prestige. A similar emphasis on fundamental science in chemical engineering became a strong national trend, encouraged by the publication of a path-breaking textbook *Transport Phenomena* by three young chemical engineering professors (Bird, Stewart, Lightfoot) at the University of Wisconsin.

When Jud King came from MIT to Berkeley early in 1963, he brought a refreshing view to Berkeley’s Chemical Engineering Department: emphasis on chemical-process design and systematic integration of large-scale separation processes. At that time (and to a smaller extent today), separation operations (e.g., distillation and extraction) were the bread and butter of chemical engineering practice.

Jud certainly did not oppose fundamental research but he pointed out that research in a department whose name includes the word Engineering is obliged to go beyond studies in fundamentals by showing how those studies are useful in designing an industrial-scale process for making a chemical product. Jud’s view was not new; it had prevailed for decades at MIT and other universities but, in the intellectual climate in Berkeley’s College of Chemistry, this classic view was often forgotten, especially by the younger faculty who tended to choose scientists rather than engineers for their role models.

For about 20 years, Jud did pioneering research in mass transfer, especially in freeze-drying of foods such as coffee and turkey meat. His distinguished published research papers led to numerous professional awards and to consulting assignments at several industrial corporations including Procter and Gamble.

Through the example of his own research and later, through his highly successful book *Separation Processes*, and through his former graduate students now in academia, Jud influenced the intellectual climate in academic chemical engineering not only at Berkeley but also at universities throughout the US and abroad. Teaching and research in basic science, yes! But that’s not enough. Chemical engineering professors must also keep in mind the ultimate purpose of their scholarly activities, *viz.* to serve the needs of the society that supports them.

Despite Jud’s virtual absence from chemical engineering since about 1985 due to his service as a high-level academic administrator, his calling attention to application has prevailed at Berkeley not only in the Department of Chemical Engineering but increasingly also in the Department of Chemistry. Today’s successful Product Development Program (PDP) is a direct consequence of Jud’s vision, not coincidentally founded and directed by Dr. Keith Alexander, one of Jud’s former PhD students.

Before he became Dean of the College of Chemistry in 1980, Jud was first vice-chair and then chair of the Chemical Engineering Department for a total of 14 years. During that time, forward-looking Jud encouraged or established courses or programs in electronic materials, polymer technology and chemical-process economics. He enlarged Berkeley's pioneering academic activities in electrochemical engineering. Perhaps most important, he encouraged, supported and enlarged Professor Charles Wilke's efforts to develop biochemical engineering within the Chemical Engineering Department. Jud's vision and subsequent actions modernized chemical engineering at Berkeley. His effective leadership brought Berkeley's Chemical Engineering Department to internationally recognized distinction.

During those years, Jud's leadership style was characterized by calm and confidence. He was a very good listener and always gave the (correct) impression that he wanted to be helpful. He never raised his voice and never showed anger or annoyance. He smiled easily and, when appropriate, showed a sense of humor. His comments, proposals and judgments were consistently given with modesty and with a sense of cooperation and always based on solid facts.

Because the University soon recognized Jud's remarkable administrative skills, after about 1985, we did not see Jud as frequently as we used to; he was rapidly moving to higher administrative positions. As indicated in the Introduction by Prof. Karl Pister, Jud's service to the Berkeley campus and later, to the entire University, was as remarkable as his earlier service to Berkeley's Chemical Engineering Department and to the chemical engineering profession. The oral-history interviews given here present a shining record of leadership that can serve as a guide and an inspiration to young faculty. This record also provides a source of pride to all of us who know Jud and admire his splendid qualities.

John Prausnitz  
Department of Chemical & Biomolecular Engineering  
University of California, Berkeley

May 2013

## Interview History

For more than a half-century, Jud King has offered distinguished service to the University of California. From his initial position as a professor in UC Berkeley's Department of Chemical Engineering, which he accepted in 1963, King rose through a series of administrative positions that placed him increasingly at the center of campus governance. King moved from serving as graduate admissions officer for chemical engineering to chairing the Department of Chemical Engineering, ultimately moving on to Dean of the College of Chemistry and eventually Provost—Professional Schools and Colleges. His outstanding administrative abilities were widely recognized, and in 1994 he was chosen to serve in the University of California Office of the President [UCOP], first as Vice Provost for Research, then as Provost and Senior Vice President—Academic Affairs until his retirement from that position in 2004. In his ten years at UCOP, King's portfolio of responsibilities was massive; he handled some of the most thorny and contentious issues facing the University, such as restructuring undergraduate admissions in the wake of the end of affirmative action and renewing the contract for UC's national labs in the wake of scandal, to name just two.

But retirement did not follow his service for the University of California system. UC Berkeley Chancellor Robert Berdahl was quick to appoint King Director of the Center for Studies in Higher Education [CSHE] on the Berkeley campus, recognizing the expertise, experience and leadership King would bring to the institution. Since 2004, King has expanded the center's programs and research interests, while conducting his own research into and writing papers on a broad range of issues in higher education.

For more than a half century, Jud King has been a consummate chemical engineer. Encouraged by his father who worked at RCA Laboratories and his mother who valued excellence in education, King pursued his boyhood love of chemistry at Yale University, where he earned his BS degree, and at MIT where he earned his PhD. His primary research has been in the field of chemical separation, with a focus on liquid-liquid extraction and drying. (Unfailingly practical, King also saw his lifelong interest in hiking translate into research into freeze-dried foods.) His textbook, *Separation Processes*, was used widely in chemical engineering courses through two editions. King also holds 14 registered patents.

While university administration and science represent the anchor poles of King's career, the arc of his life embraces a multitude of interests, experiences, accomplishments. He is a devoted husband and father. He is a passionate outdoorsman. And the record of his service to various publics, be they community, state, or national professional organizations, is outstanding. In all corners of his life, Jud is held in the highest regard.

The twenty two interviews that comprise Jud King's oral history were conducted in the CSHE library. Between May, 2011 and May, 2012, ROHO academic specialists Emily Redman and Lisa Rubens met with King to establish topics to be discussed and then alternated their questioning according to their academic specialty: Redman focused on King's education, research, publications and science related activities—including corporate consultations; Rubens focused on King's role as a professor, educator and university administrator. Sam Redman, ROHO's academic specialist on community and institutions, interviewed King about his tenure as Director of the Phoebe A. Hearst Museum of Anthropology on the Berkeley campus—a

position King held while also director of CSHE—during which a heated debate took place between the University and Native Americans over the repatriation of human remains. In general, these interviews follow King’s life and work chronologically, but they also pursue many lines of inquiry stemming from his multiple interests and activities.

King is a vast storehouse of knowledge. He delights in learning and facing challenges. As he explains, “I like things that are mind opening, mind expanding.” Yet also evident throughout these interviews is a certain modesty and humor that cushions the weight of the vast responsibilities he has assumed. Many people, including those with whom we conducted background interviews, have commented on keys to Jud King’s outstanding professional success—his affability, his “even handed style,” his capacity to understand, build consensus, and act on complex and politically charged issues. Those reading this oral history will see these traits exhibited as King narrates his wide-ranging experience. His response to questions is graced with deep reflection and questioning of his own. Whether overseeing UC’s Keck Observatory, restructuring UC Press, or chairing the board of the American University of Armenia, to name just a few of his many responsibilities discussed in these interviews, King’s insights make for provocative stories and lessons, and a fascinating oral history.

Emily Redman  
Lisa Rubens  
Regional Oral History Office



## C. Judson King Oral History

Interview 1: May 2, 2011

### Audio File 1

01-00:00:00

Redman:

I understand that you were born in 1934, in Fort Monmouth, New Jersey, which happens to be less than an hour from where I was born! You didn't stay there, or any place, for that matter, for very long, though, due to your father's job and moving the family around. Can you tell us a little more about what your father was doing and how this impacted your family?

01-00:00:28

King:

Sure. My father was a [United States Military Academy,] West Point graduate, class of 1924. He served on active duty in the [United States] Army, from '24 through '54. He was in the Signal Corps, which was how the Army was organized at that time. The Signal Corps no longer exists. Fort Monmouth was the principal headquarters of the Army Signal Corps, so he was there in connection with that capacity, and I was born in the post hospital. We lived there, I think, less than a year before moving.

01-00:01:04

Redman:

Where did you go next?

01-00:01:06

King:

We went to West Point, and my father was on the faculty there. The faculty at West Point in those days was done with temporary assignments of career officers, not so much with permanent faculty. He taught electricity and chemistry as one course, and he even had a little book related to the subject, which is in the Library of Congress. It was written with some contributions from Fred Terman, who later was the famous Provost of Stanford and who is given much credit for setting the stage for Silicon Valley.

01-00:01:28

Redman:

What's the book called?

01-00:01:32

King:

Radio and Vacuum Tube Theory.

01-00:01:36

Redman:

Can you tell me a little more about the Signal Corps?

01-00:01:39

King:

Well, the Signal Corps had a number of functions. It goes back to where messages were sent by Morse code and semaphore and whatever. The Signal Corps picked up other functions as electronics

came along, and in particular, weather forecasting. Another one of my father's interesting duties was in the Aleutians Campaign of World War II, the first couple of years of World War II, when the Japanese had invaded some of the islands out on the end of the Aleutians. He was up there in the weather forecasting business. Since that war was one where much of it was air warfare, and the weather was horrible, the weather forecasting was a very important part of it. That's another thing the Signal Corps did. Then, eventually, the Signal Corps had laboratories just south of Fort Monmouth, and that's where the government research on things electronic was done. My father's final post, as a matter of fact, was at Fort Monmouth, in charge of those laboratories.

01-00:02:55

Redman:

Okay. What was his educational background?

01-00:02:59

King:

He had grown up in Georgia. He was born in Rome, Georgia. He had gone to Columbia [University] for one year, and then, through whatever mechanism, and I don't know what the mechanism was, he received one of the two appointments from Georgia to West Point in the particular year. With that, he then transferred into West Point, and the rest of his college education was there.

01-00:03:25

Redman:

Do you remember all of the places that you lived throughout your childhood?

01-00:03:32

King:

I think I'm still able to list them in order, yes.

01-00:03:35

Redman:

In order, too!

01-00:03:37

King:

Chronologically in order.

01-00:03:38

Redman:

All right, well, give it a shot.

01-00:03:39

King:

Not alphabetically. That would be more difficult.

01-00:03:42

Redman:

So what were they?

01-00:03:46

King:

We lived in West Point until about 1940.

01-00:03:50

Rubens:

What constituted "we" by the way?

01-00:03:52

King:

Our family. That's three of us. I was an only child, so it was my father, my mother, and me. My father, incidentally, was also an only child. My mother had a sister. We lived in West Point until 1940, and then my father, after the tour of duty at West Point, was put with the Second Army. The Second Army was first in Glencoe, Illinois, just north of Chicago. We moved there. That didn't last very long. The Second Army was then moved to Memphis [Tennessee]. We went to Memphis after Glencoe, Illinois. I remember December 7, 1941 quite well, because we would, each Sunday, have a special treat of going to the local cafeteria for Sunday dinner. I remember on December 7, we walked in. My father was in uniform, and the whole cafeteria stood up and applauded him.

01-00:04:57

Redman:

Wow.

01-00:04:59

King:

That's just because of the reaction to Pearl Harbor, which had occurred earlier that morning. So that puts us in Memphis. Then, after Memphis, my father went to the Aleutians, for the Aleutian Campaign, which I mentioned. My mother had grown up in Houston [Texas], and so she and I moved to Houston and lived across the street from her mother and father, my grandparents. We were there for all of World War II. My father went through the entire Aleutian Campaign, which ended either late 1942 or early 1943. I'd have to check that. [August 1943]. But then came back for two weeks of leave, for which we met him in San Francisco [California]. That was a very unusual thing, to be able to travel from Houston to San Francisco in those days, but my grandfather was an auditor for the Southern Pacific Railroad and was able to get tickets. So we went to San Francisco. Actually, before that leave was completed, he was ordered to Europe, and he spent the rest of the war on the SHAEF [Supreme Headquarters Allied Expedition Forces] staff with General [Dwight] Eisenhower. First in London [England], and then after the invasion and after we'd secured enough land in invasion and gotten into Germany, he was then in Frankfurt [Germany].

01-00:06:22

Redman:

Okay. And you were not there?

01-00:06:25

King:

I was in Houston the whole while.

01-00:06:28

Redman:

Is that where you stayed after—

01-00:06:28

King:

Now, shall I keep going?

01-00:06:30

Redman:

Yes, yes.

01-00:06:31

King:

Okay. World War II ends.

01-00:06:33

Rubens:

What is the SHAEF?

01-00:06:38

King:

SHAEF. Supreme Headquarters Allied Expedition Forces. They had an emblem with a torch on it. So World War II ends and my father is transferred back to the Pentagon in Washington [D.C.], which is a fairly new building at that time. We move there. We're in Fairlington, which was the original, large, connected housing project done in the area. It still exists. Then the Army sent him to MIT [Massachusetts Institute of Technology] for continued training. It was, I think, decided that he would go the technical path within the Signal Corps, which is really what he'd been doing all along anyhow. He then went to MIT and was in the graduate program there, working, interestingly enough, in research with Jerome Wiesner, who later became president of MIT and who was also science advisor in Washington at one point. My father was one of the first recipients of the electrical engineer degree. The Army would not let their people stay long enough for a doctorate, so this is what could be done in a three-year stay.

After that stint, where we lived in Belmont, Massachusetts and I was in junior high school, we then moved back to the Pentagon. This time they bought a real house in Alexandria, Virginia. My father was the deputy chief signal officer in the Pentagon. I was enrolled in a private school, also in Alexandria, by the name of Episcopal High School [EHS], which still exists. In fact, it's John McCain's alma mater. John McCain was two years behind me. A youngster. Now I should go on. We've done Alexandria, Virginia. I've gotten through high school. I go off to Yale, as we'll talk about.

01-00:09:15

Redman:

Did you spend all four years at Episcopal High, or—

01-00:09:19

King:

All four years at Episcopal? It was, in fact, three years. Tenth, eleventh, and twelfth grades.

01-00:09:27

Redman:

So you did ninth grade in Massachusetts?

01-00:09:29

King:

Ninth grade was part of junior high school. Seventh, eighth, and ninth.

01-00:09:33

Redman: I see. Okay, and that was in Massachusetts?

01-00:09:35

King: Yes.

01-00:09:36

Redman: I see. It is quite disruptive to be moving so much. I'm actually interested in how your mother adapted to that.

01-00:09:48

King: Well, it was not a happy day when we would learn that we had new orders to somewhere. Of course, it was an enormous job to get packed. My mother, being very concerned about the wellbeing of everything we owned, would always want us to do our own packing. Just the movers would come. We would have packed in the wooden crates before they came. It was a big job to move. I think my mother would have preferred not to move as much, but she did so quite willingly. It was a very interesting experience for me. It gave me the continual challenge of adapting to entirely new people. Not a matter of old and constant friends. Always finding new friends, new relationships. Figuring out a new place and what made it tick. That was a challenge. I've seen the difference. Our own children were in California all the way, and it's a very different circumstance.

01-00:10:54

Redman: I know that a lot of people who have had similar childhoods do talk about the difficulty in maintaining lasting friendships. Do you have lasting friendships from your childhood?

01-00:11:06

King: I would say not from junior high school. The private high school, Episcopal High School, has all of the alumni networks and magazines and whatnot that you would expect of such a school. Particularly since there were, I think, five of us in my class from there who went to Yale, I do maintain friendships from there.

01-00:11:33

Redman: And how about your mother? Did she have difficulties in developing friendships and moving around so much?

01-00:11:41

King: Well, less so, because the Army was a small world in those days, and the Signal Corps was smaller yet. If we were in a location where there was a Signal Corps enclave, they knew people. Then there were traditions, quite interesting traditions. I can remember New Year's Day, for example, which was when I, as a child, would just stay up in my bedroom, listening to football games. Always, downstairs, a continual flow in and out of people—"calling," it was called. You called on someone. You called on your commanding officer on New

Year's Day. You called on your superiors. There was a big circulation of people and friends, particularly when it was an Army post. We didn't live on Army posts that much, but one place we did was Fort Monmouth the second time, which was when I was in college. Then there were locations where we were. There were good many Army people around anyhow, and that was the social life. So back to the question on my mother. Her social life was really tied to two things: the Army and her family.

01-00:13:04

Redman:

How had they [your parents] met? She was in Houston?

01-00:13:06

King:

Well, they met at Fort Sill, Oklahoma, and were married in 1928. I came along in 1934, so there's another six years there. My mother had done two years at Rice University, which was a very new place at that time. In fact, I think it was called Rice College then. That's in Houston. Then her last two years had been at the University of Texas in Austin. I suspect it was some kind of dating thing, or blind date thing, where they brought interested women from the University of Texas up to Fort Sill. Somehow they met one another, and I never knew exactly how. But married in 1928. And then before I came along, they had been at Fort Monmouth once before, so they actually had three postings at Fort Monmouth, and had had an interesting two years in Hawaii—the Schofield Barracks on Oahu. Then my father had also gotten a master's degree from Yale [University], which is '29. That was one of the very first things they did after being married.

01-00:14:20

Redman:

What did she study in college?

01-00:14:25

King:

Now you have stumped me. It was surely not a science. It was probably a very conventional humanities curriculum, I think. I don't know the actual major. It's interesting that I don't. I never asked.

01-00:14:51

Redman:

That's what we're here for! You must have also faced some very real challenges in having to switch schools so often. First, did you ever have to switch schools in the middle of the school year?

01-00:15:04

King:

I think so, yes. These were mostly private schools. That's another interesting part of it. We would move somewhere, and the general mode is that my parents, and I think driven very much by my mother, would look for the private school. My mother invested her whole life in me, this one child. So to try to find a good private school and get me there. Sometimes I would go right into the private school. Other times, a little while in a public school, and then the private school got

arranged, I'd go into it. They were private schools. Now I've forgotten what your question was.

01-00:15:46

Redman: I was asking whether you needed to change schools in the middle of the year.

01-00:15:49

King: Yes, I did. That was sometimes difficult. Since school curricula were not all that standardized in those days, it also meant that I had some things two and three times. I'm a real tiger on diagramming sentences. I did that three times.

01-00:16:08

Redman: And there must be things that you missed, too.

01-00:16:09

King: And there must be things that I missed, but I can't think of what they were.

01-00:16:12

Redman: You don't know what they are, right. Now, why was it so important to be in private school for your family?

01-00:16:19

King: Well, I think there was a feeling that the public schools were not as good as the private schools, and they wanted to put me in a good and stimulating school that would move me to do my best. I know a little bit about all of the search and decision that went on with regard to Episcopal High School—which was their choice, not my choice, but a good choice. It was definitely chosen for the academic standards. What they could find out about the quality, and in that case, what colleges the graduates of the high school would go on to.

01-00:16:53

Redman: So it's clear that your parents were very invested in your education. In what ways did they participate in your education other than just finding you schools?

01-00:17:05

King: Well, I can remember having flashcards held up to me by my mother. They would express an interest in things as I went along. What I was writing a paper on, this sort of thing. There were, of course, rules of the house. You did the homework. Fortunately, we didn't have television around until much later. That, of course, could siphon off a lot of your time. It was just plain expected that I would do homework at night, and so I did.

01-00:17:40

Redman:

So there likely was some sort of pressure, but it didn't feel like pressure to you?

01-00:17:45

King:

It felt like the norm. I think in hindsight, it could be called pressure. It was probably a firmer hand than Jeanne and I put on our own children. My path through schooling was designed for me. It was not picked by me. And it was with the expectation that I would do my best, try hard, and perform.

01-00:18:140

Redman:

Did you ever resent those decisions being made for you or did you not even really recognize—

01-00:18:20

King:

No. You're getting to why I'm a professor. I liked this. I like knowledge. If I hadn't enjoyed it, things would have been very different, I'm sure. But I did enjoy it.

01-00:18:38

Redman:

Changing schools is difficult enough, but school will give you some sort of stability, and it gives you a group of friends. I'm also curious, what did you do during the summers?

01-00:18:51

King:

What did I do during the summer? I have an answer to that that starts in 1946. Before that—well, I would have friends. It might be three or four or five, and I would see them on various days and do things together. Probably more than the average, I was a loner, too. Let me put that in a positive way. I developed the capabilities of amusing and taking care of myself and doing worthwhile things. I could as well do things on my own as with others. I did both. Now, as of 1946, my parents had me in summer camps. In fact, it's earlier than that. It's as of 1943 or four. I went to two weeks of a summer camp in '43 and '44. I went to an eight-week summer camp, '46 through—I'm not totally sure of my year here—through '50 or '51, and then one year as what would now be called an intern, but was called a work boy then, and one year as a counselor at the same camp. That one was up on Lake Champlain, just north of Plattsburgh, New York.

01-00:20:26

Redman:

Did you go to different camps every year except for that?

01-00:20:28

King:

It was the one on Plattsburgh for all of the eight week stays. There was one in Texas, Camp La Junta during World War Two. That was actually very close to the LBJ [Lyndon B. Johnson] Ranch, although I certainly didn't know that at the time. But that vicinity.



01-00:20:48

Redman:

Did you enjoy that time?

01-00:20:50

King:

Yes. I think camp is the start of my strong interest in the outdoors, and that's something that stayed with me my whole life. At Camp Red Cloud, which was the one just north of Plattsburgh in New York, there were reward trips in the seventh and eighth week of camp. The reward trips were to go climb a mountain. (By a trail, not by your fingernails.) So we would climb a mountain. Go up a trail to the top of a mountain. I loved that. That really fed me onward to something. It sustained me all the way.

01-00:21:28

Redman:

Did your parents share a similar enjoyment of the outdoors?

01-00:21:32

King:

No. I'm the one who found that one. That didn't come from them at all.

01-00:21:38

Redman:

Interesting. It seems like we could talk a lot about the obstacles that you had to face in moving around so much, and you mentioned a few things, but what were the benefits? What do you think that you were able to sort of build upon?

01-00:22:03

King:

I believe it's either eight or nine different schools that I went to in growing up. I think it's nine, but that requires that there had been a public before a private in Memphis, which I think was the case. This means that, on eight or nine different occasions, here I was confronted with starting all over again, and meeting people, and deciding how to handle situations, and going through the process whereby one might develop relationships that lead to somebody being your friend. I think it develops a lot of self-reliance, and maybe some confidence that you can do these things. I'm not fazed by problematic situations. If anything, I'm challenged, and enjoy the logic you have to go through in dealing with some complicated new problem. I think that started with all of that. I was also naturally more shy than the norm. That added to the problem of getting adjusted at each of these new schools.

01-00:23:22

Redman:

Looking back, if you had your choice, would you prefer to have stayed in once place?

01-00:23:30

King:

That's an interesting question. I don't know that I wanted nine different schools, but the moving around, I think, was, on the whole, beneficial. It was because it enabled me to see and appreciate the differences between different parts of the country. Also, I think I

developed more of a sense of initiative and just going out there and getting things and doing things. If life is comfortable and you're in the same place all the way through, I think you have a lesser tendency of that sort.

01-00:24:14

Redman:

That makes sense. I'm particularly interested in learning about your high school experience.

01-00:24:20

Rubens:

May I just ask a couple questions before that? I'm just curious about your attention to World War II. Here your father is away. You have a vivid memory of D-Day. Did you follow various campaigns?

01-00:24:36

King:

I sure did. I was one who had the maps that you tore out of the magazines, or which came in the mail. Then you had pins with flags on them. There was a Japanese flag and a U.S. flag and a British flag and a German flag. You put the pins in and you moved them according to the daily newspaper reports. I did all of that, in a way that was not appreciating the nature of the war, but I certainly had a strong interest in following this thing and how it was going.

01-00:25:14

Redman:

And then my one other question about the war is, do you remember the dropping of the bomb?

01-00:25:20

King:

Yes, I do. Yes, I do. I think the first one of these, I was at summer camp. It had happened. It was at the very end. It was '45 and it was the very end of the two-week session that I was there. This was in the newspapers. I remember reading it as I went back to Houston from there. I do remember the Nagasaki one several days later. I think that made a profound effect in two ways. One is just the fear that we all had back then, that, oh my god, one of these things is going to come and get dropped on us, now or next year or whenever. That wore off a few years afterwards. The other one was as a very vivid example of what science and engineering—and I probably didn't know the difference between the two at that time—what they were able to accomplish. The effect on me was profound enough so that, with that having happened, and with nuclear power having been on the scene soon thereafter, I very nearly majored in nuclear engineering once I got to MIT. It would have been chemical [engineering] at Yale—no nuclear there—but going on to nuclear for graduate work. I didn't do that, but I took some courses in nuclear engineering.

01-00:26:59

Rubens: Before we get ahead in your story, I just want to ask about your early science interest.

01-00:27:08

King: I had a chemistry set.

01-00:27:15

Rubens: Did your father encourage that?

01-00:27:16

King: Oh, yes, sure. He had been in on the very early days of radio. One of the very first things he worked with me on was getting me to build my own crystal set receiver, where you move the whisker around on the crystal, and in some position, here comes a radio station through the headphones. I did that. He took me to some more advanced kits. Actually, even after we moved to California, I built myself a shortwave radio. We still have it in a closet. We don't use it, but I did build it out of a kit. So I had those interests, too. Yes, I think my father probably gave me a very positive feeling towards the combination of science and engineering.

01-00:28:24

Redman: Did you have a sense during the war of how important wartime science was, or was that not until after?

01-00:28:35

King: I didn't know anything about the radar lab at MIT or any of these things that were earlier in the war. It was as it all came out about the atomic bomb project that I really saw the importance from that.

01-00:28:53

Redman: If we can jump back to your high school experience, you went to Episcopal High School, which you mentioned. Can you tell me a little bit more about that school?

01-00:29:05

King: Well, yes. It was founded in 1839. So it's been around a long time. It was located in rather rural Alexandria in its earlier days, and through to my time, actually. There was not a lot of housing around it then. As I've gone back over the years, it's now captured in a totally urban setting, and it's just a plot of land in the middle of all of this. It's a school that was administered on its own, by its own board. It shared grounds with the Episcopal Theological Seminary, which is also there, but they were two separate administrations. It had a resident faculty. The faculty actually lived on the grounds, they and their families. It was mostly a boarding school. I was a day student. Out of a class that may have had, oh, let's say forty people in it, about five of us were day students. That meant that there was a whole life there that I wasn't part of in the evenings. The dining hall at night and all of that. But I was

there in the dining hall at noon. It was very close to where we lived, which was also Alexandria. It was definitely a Southern school, so that the Civil War was the War between the States.

I remember that my history teacher had been a delegate to the political convention that nominated—I think it was John W. Davis—who ran against Calvin Coolidge in 1924. There was some interesting background in the faculty. There was a math faculty member who had been my father's student at West Point. Harold Brown was his name. He had retired early on—an injury—and was a teacher of math, calculus, at EHS. It was a very strong school academically, and it was not all that unusual that five members of my class went off to Yale. Other than that, it would send its graduates to the University of Virginia, the University of North Carolina, Sewanee [The University of the South], and other schools around the South, largely. But I think a very positive school, and certainly an excellent chemistry education there. That is what sent me on to my direction of becoming a chemical engineer.

01-00:32:15  
Redman:

Did you ever consider boarding at the school?

01-00:32:18  
King:

No. I think my parents did. I didn't. But there was no argument about this, either. I think if they had decided that I should board there, I would have boarded there. I was not piloting my own way at that point.

01-00:32:36  
Rubens:

How about the religious education there?

01-00:32:39  
King:

There was chapel every morning. Other than that, no back and forth with the seminary, and just the chapel every morning.

01-00:32:49  
Redman:

Did you grow up in a religious family?

01-00:32:51  
King:

My mother and father were both Presbyterian. I think Episcopal High School was picked despite it being Episcopal.

01-00:33:05  
Redman:

So that was important to them, but they—

01-00:33:07  
King:

Well, I think the caliber of the education was what was top on their mind.

01-00:33:13

Redman:

Right. And just for clarification, to get this on tape, you graduated from high school in 1952, is that correct?

01-00:33:22

King:

That's right.

01-00:33:25

Redman:

Many scientists speak of an ah-ha moment. Sort of that moment that they really realize their love of science. Do you have an ah-ha moment?

01-00:33:38

King:

I don't think I do. If it is anything, it was figuring out, as it all came out, what had gone into this atomic bomb, and the fact that that was such a work of science. Another thing that happened at Episcopal High School that relates to this is that you would get prizes and awards at the end of the year. So I got some prize books that were history of science in nature, and I read them avidly. So I learned all about the Bohr atom and quantum theory and wave theory from these books and so forth. All of that I had read books on, and so that fed into it, too. I think, with regard to my own empathy with science in a personal way, it came through the high school courses, and mostly the chemistry course. There was a very severe teacher of chemistry who had been doing this for years and years and years. His name was Charles V. Tompkins. He, first of all, made the lab interesting. The second thing he was known for was keeping students in his class awake by having a basket of chalk right here at his right hand. If somebody was looking at the wall or out the window or drifting off, you had a piece of chalk thrown at you.

01-00:35:22

Redman:

Sounds like the typical science teacher.

01-00:35:23

King:

That kept you awake.

01-00:35:28

Redman:

You just took one year of chemistry in high school?

01-00:35:00

King:

Yes. Well, and also, he encouraged us to work in the lab late afternoons and nights, too. It was available. That was for good and for not so good, because I do remember one occasion where one of my classmates decided that he'd find out what happened when hydrogen and oxygen got together and had a flame put at them. He had a glass tube from a hydrogen source, a glass tube from an oxygen source, feeding into a T, and both coming out. He holds a flame up, and my god, what a huge explosion. Blew glass all over the lab. Totally unsafe. Nonetheless, the positive aspect of this sort of thing is we were

encouraged to get in there and do things and learn things. Become familiar with it all. I think that was very positive to me.

01-00:36:29

Redman: And do you remember which year you took chemistry?

01-00:36:38

King: I'm not dead sure, but I think it was my junior year.

01-00:36:40

Redman: Okay. I assume you probably also took physics and biology?

01-00:36:46

King: I did not take biology. I did take physics. I took all the math there was, through calculus, which Harold Brown offered as a special course. There were, I think, three of us taking calculus that year.

01-00:37:02

Redman: Did you know, going into high school, that you were interested in pursuing science?

01-00:37:13

King: Probably so. It slowly grew on me. As I say, the thing that really triggered me was learning about what had happened, particularly the Manhattan Project and the way that had brought science into action for a purpose that ended the war. Of course, we then get into whether the bomb was good or bad, but the big thing back in those days was that it had ended the war, and that was certainly a good thing, to end the war.

01-00:37:50

Redman: Did you know that you wanted to pursue chemistry in particular?

01-00:37:57

King: I think after the chemistry course, yes. I even went to Mr. Tompkins—and that's who the faculty were. It was Mr. this, Mr. that. So I went to Mr. Tompkins and had a conversation at one point where I said, "I like chemistry. I like math. What should I look to major in in college?" The answer was chemical engineering.

01-00:38:27

Redman: And you were pretty sure that's what you were going to do by the time you got to college?

01-00:38:31

King: Yes. I suspect if we could go back and recover my essay on my application form, we would find the words "chemical engineering" in there.

01-00:38:47

Redman: In my high school, science labs consisted of long lab benches, and then closets or cupboards filled with pretty basic laboratory equipment.

Scales, beakers, measuring sticks, stopwatches, that sort of thing. What were the laboratory facilities like in your high school?

01-00:39:10

King:

You have to remember where chemistry was in those days, too. The answer is beakers, and asbestos pads, and Bunsen burners, and flasks. Round-bottom flasks, beakers, spatulas, et cetera. That was what you had. Then over on the side was a set of jars with all sorts of chemicals in them. Then you had benches—which were these black, wood benches, which would have spigots for gas, probably, only—that you plugged your Bunsen burner into. That was it.

01-00:39:59

Redman:

I'm interested in hearing the difference between the assigned laboratory experiments and then those that you did in your spare time.

01-00:40:12

King:

Well, the assigned experiments would be from a book of experiments. One thing we would do on our own is other experiments that weren't assigned. Oh, I do remember once brewing up gun powder and lighting it to see what would happen. It burned. It didn't do anything else. By and large, it was either the assigned experiment or ones further along in the book.

01-00:40:50

Rubens:

Do you remember a chart of the periodic table?

01-00:40:53

King:

Oh, yeah.

01-00:40:54

Rubens:

Just because Berkeley would figure so much in what was added to that.

01-00:41:01

King:

This gets us way ahead of things, but that was one of the more interesting things about coming here, of course, was all of that history of the transuranium elements, and being in the College of Chemistry where that had happened. There's their periodic table sitting up there on the wall. That was quite striking.

01-00:41:23

Redman:

Did you continue to dabble in the chemistry lab even after you were done with the course your junior year?

01-00:41:39

King:

Probably not in the senior year. As we discussed earlier, I believe the chemistry course was my junior year. Senior year, I had other courses, and I don't believe we had the rights to simply go into the lab if we weren't registered in the course.

01-00:42:03

Redman:

But you maintained a relationship with Mr. Tompkins?

01-00:42:06

King:

Oh, yes. He died rather soon after my graduation. I did have some correspondence back and forth with him, and I think at least once went back there and saw him.

01-00:42:25

Redman:

Would you consider him to be your most influential teacher?

01-00:42:30

King:

From high school, definitely so. Yes. And secondarily, Harold Brown.

01-00:42:38

Rubens:

Was that a coed school?

01-00:42:40

King:

It is now. It was not then.

01-00:42:42

Redman:

Were there women teachers?

01-00:42:46

King:

I think the best we could do was the nurse. But of course, now, it is coed, and fifty-fifty, just about, in enrollment, and the faculty is fifty-fifty. It changed when—I've forgotten exactly when it was. It was as the private, one-gender universities were changing.

01-00:43:09

Redman:

Is it still a boarding school?

01-00:43:12

King:

Yes.

01-00:43:18

Redman:

Were you able to get a sense of what being a scientist would be like in high school? Or did you think you did?

01-00:43:29

King:

This is a rather fundamental question. I want to address both science and engineering here. I don't think we do a good job in early education of enabling our students to know what science is like, what engineering is like. I think the thing that was not apparent with regard to science in the high school was the thrill of the chase of something entirely new or something unknown. It was more, follow the rules and you will see that this happens and that happens, but not exploring the unknown. In that sense, I would say I got an incomplete view of what science is like, but I think everybody got an incomplete view. The same problem exists, only even more so, for engineering. In the early part of engineering, and in the parts of engineering that make it into



high school, and some do, what engineering is about doesn't come through. The problem-solving aspect or the design aspect. You have to be several years into it before you can appreciate that.

01-00:45:00

Redman: What did you think chemical engineering was going to be like at that point?

01-00:45:05

King: I thought it was going to be chemistry and mathematics. Two subjects that I liked.

01-00:45:13

Redman: So you were really, at that point, probably thinking of your major, not exactly your career.

01-00:45:21

King: Yeah. That was the question: what to major in.

01-00:45:25

Redman: When I was in college, it was pretty much a rite of passage that you would have some sort of junior year internship, fellowship, at a lab in the sciences. Do you think that that helps?

01-00:45:40

King: Junior year of college?

01-00:45:42

Redman: Yes, sorry, it was in college.

01-00:45:44

King: And the lab would be something out in industry, say?

01-00:45:47

Redman: Right. Do you think that that helps students get a better sense of what it's actually like to be a scientist?

01-00:45:54

King: Yes, I think it did. I had summer jobs starting 1953, through '56, so that was four summers of summer jobs. That was useful for getting a better picture of what life was like out there.

01-00:46:21

Rubens: Was your father engaged with some of these studies that you were doing? The chemistry and math.

01-00:46:27

King: No, not particularly. We would have dinner table conversation. What are you doing now? I'm doing this. But in terms of the doing, I did the doing myself.

01-00:46:45

Redman:

If we can jump back a bit, after World War II, there was a major push to encourage students to study science. Can you give some examples of what you saw for this sort of encouragement?

01-00:47:03

King:

What I saw?

01-00:47:04

Redman:

Right. Can you describe the atmosphere of encouraging students to pursue careers in science?

01-00:47:17

King:

Well, this gets later in my career. Certainly as I was going into graduate school, that was when Sputnik was happening and when the NDEA, National Defense Education Act, was producing scholarships. The National Science Foundation [NSF] was still relatively new, but it had its fellowships. We'll get to this later, I suppose, but I went through graduate school on something called a General Electric Fellowship, which the company, General Electric [GE], gave as fellowships that were comparable to or even a bit better than the National Science Foundation ones. So there was that. It was clear that you could get support for your education if you wanted to go into science. It was a very noble and encouraged thing to be in science and engineering. That was clear. I never thought about the job market, which is interesting. My choice of chemical engineering was not based on any knowledge of the job market, not based on much knowledge of what chemical engineers do. It was seriously just, what do you do if you like both chemistry and math?

01-00:48:46

Redman:

And you didn't see a push to encourage students immediately after the war? You didn't see that really until Sputnik?

01-00:48:53

King:

It wasn't that visible to me, not until I got to the graduate student years and here was NDEA, which was a big, big effort to create fellowships. I was also oblivious to the big push in research spending, with one exception. Up until I actually got into the business myself of having to get government money for research, and I watched it build during my early years, the one exception is that it was very clear to me that the U.S. Army Signal Corps labs at Fort Monmouth had gotten a lot of development after World War II. And so they did. The size and budget for that operation really, really went up. That was apparent from a number of things my father would talk about. One of the things they were involved in was the very early work on cloud seeding for rain. It was actually done by a team of Irving Langmuir and Vincent Schaefer at General Electric Company, but the Army funded it. Lots of stories came home about the interactions having to do with the cloud seeding,

which is still not resolved to this day. There are a lot of people who think cloud seeding doesn't accomplish anything much at all, but they were quite large efforts on that back in those days, which would have been when I was in high school.

01-00:50:30

Redman:

And your father was not involved in that?

01-00:50:33

King:

He funded it, because he had the labs and was responsible for them. He did the funding. He would be the Army's representative, if you will, in that relationship.

01-00:50:45

Redman:

Okay. Interesting. Did you feel that when you were in high school there were a number of other students who felt the same way that you did about science, in that it was sort of newly heroic? You can look at it as a service after seeing the value of science in winning the war.

01-00:51:09

King:

Well, there was certainly a number of other students who were strongly interested in science.

01-00:51:13

Redman:

For similar reasons?

01-00:51:14

King:

Seemed to love it. I don't know about the reasons. We wouldn't discuss them. There you were. You had other kinds of conversation, not why you had gotten into this. There were probably another five or six in my class at EHS who were very driven to science and interested in it.

01-00:51:40

Redman:

Did the four other students who went to Yale all pursue science or did they pursue all over the place?

01-00:51:48

King:

One went on to an Army officer career. Now we have to think specifically about people. Certainly, at least a couple of others did, yes—carried through.

01-00:52:12

Redman:

At the time you were in high school, I believe you're really just starting to see the introduction of brand-new textbooks. Do you remember any of your textbooks?

01-00:52:25

King:

You want science textbooks?

01-00:52:26

Redman:

Yes, preferably.

01-00:52:28

King:

I did not take [Joel] Hildebrand's freshman chemistry book. I do not remember the authors of those books. That one's not going to lead to anything good. Yes, I did study [Paul] Samuelson's economics when I was in college. I don't even remember what college freshman chemistry text I had, or high school chemistry text.

01-00:53:03

Redman:

I'm not sure if you would remember this, but I do know that in math texts especially, you would start to see a lot of wartime rhetoric in things like word problems and that sort of thing. Do you remember if—

01-00:53:21

King:

I don't remember that. I still have my high school calculus book. I can take a look. I still have my calculus book from Yale, also—advanced calculus. No, I don't remember that. It was pretty classical. It was [Isaac] Newton-type things.

## Audio File 2

02-00:00:00

King:

[Regarding other activities in high school:] And that [soccer] was a winter sport in Virginia, and so you played it on the frozen ground, which was interesting. We had a league that EHS was in that had many of the other schools around Washington, such as Saint Albans and Sidwell Friends and so forth. I gave no attention to whether I had somebody on the other team who was the son of a congressman or a senator. I presume I did have somebody on the other team who was, but that never came into it all that much. So soccer was one thing. I did stamp collecting and coin collecting. My father had been very helpful on that, bringing all sorts of interesting things back from Europe during World War II. That composed a lot of the collection, so I would spend time on that.

The other thing is that I was something of a Civil War buff. That's, I suppose, not surprising, considering the fact that it happened right where I was and had a lot of involvement with my high school, as a matter of fact. During the Civil War itself, the Southern Army had closed the high school and had used it as an infirmary, a place for the sick and wounded among the troops. It had very much of a role in that. There are indeed some books that give the history, which one can find on the web through Google. Open Source, so you can read the whole book. Some of these do describe the ebb and flow of the war through the high school. With that, and with the war, which was the "War

Between the States,” being mentioned so often in class, I would often go out and look at battlefields. I’ve been to just about every battlefield there was in the vicinity. Gettysburg got so much attention that I actually built a model of it for a class in school. Here was the battlefield at Gettysburg, and Cemetery Ridge, and Seminary Ridge, and Pickett’s Charge went here, and so forth. My mother and father and I must have gone up to Gettysburg four or five times and driven all around. Have many photographs from there. The other thing I built a model of was Mount Vernon, I think the year before. Same class, whatever it was. Of course, we visited Mount Vernon many times, too, because that’s very nearby to Alexandria. So the history of the area was another thing quite fascinating.

02-00:02:53

Rubens:

Did you have family that were in the Civil War?

02-00:02:56

King:

Yes indeed. On my mother’s side, there were several Civil War veterans among the four mayors. We have the collection of letters written by Thomas G. Duncan, who was two generations back before my mother. He had been a drummer boy with the Confederate Army in the war. There are some other branches. We have, over the couch in our living room, a portrait of General Daniel McClure, who was in the Union Army, and who was the paymaster in San Antonio [Texas] at the start of the war. There’s a whole long story about what was going to happen to the portion of the U.S. Treasury that was in San Antonio to be paid to people as the war broke out and Texas went with the Confederates. The money was gotten out by the family. That’s one that’s on the Union side. On my father’s side of the family, there was also involvement in the war. My grandfather, his father, had been born in Portsmouth, Ohio. That was the Northern side, but there were also Southern ones who got into that family also. It was torn. My mother was born in Louisville, Kentucky, and so the Duncans who had been there—Kentucky was a torn state during the Civil War. The Duncans were all with the South, but everybody around them had been split between.

02-00:04:37

Rubens:

How far did you trace your family back?

02-00:04:41

King:

I’ve got documents that do it, particularly on my father’s branch of the family. My father’s father is the King branch of the family. We can go back about six generations. My father’s uncle was a Baptist preacher in Americus, Georgia. Spencer King. Uncle Spencer wrote a book about his life towards the end of his life, and the generations are well packed into that. We can go back three or four generations on the Forbes/Duncan side of it, which was my mother’s family.

02-00:05:28

Rubens:

Now, you mentioned that you didn't know if you were playing against a congressman's son or some diplomat's son in soccer. How about at your own school? Were there children of bigwigs there?

02-00:05:44

King:

Well, the biggest one I can come up with was the son of an admiral, who was John McCain. I believe the admiral was also named John McCain. The name carried on between the generations. As I mentioned earlier, John McCain, the one who just ran for president, was two years behind me at EHS. He was not much of a scholar. He was sort of a Peck's bad boy. He has acknowledged that in things that he wrote about his early life. He was there. Rather short of stature, as I remember. And very full of energy. So that was one. I of course have learned more about the various people as the alumni news have gone over the years. In my class, I don't think there were ones that were particularly associated with the government or with prominent figures, other than McCain two years later. For example, Eric Sevareid's two sons went there. You can read the alumni news, in the magazine that comes monthly, and there are other children of congressmen, senators, whatever, who do go there.

02-00:07:00

Rubens:

I have one other line of questioning. I don't know if this interrupts where you were going. The Korean War breaks out during your high school years, and McCarthyism. I'm just wondering about your reaction to both of those or to the impact that it might have had.

02-00:07:22

King:

Well, I remember the breakout of the Korean War. It of course raised the immediate question of whether you were going to get drafted. I was reading the newspapers then. I would follow the progress. I remember Inchon and other key events along the Korean War. The other one you mentioned was McCarthyism, and that's a little more interesting, because it was [Joseph] McCarthy versus the Army. I do remember the summer of 1954. We would watch those [hearings] on our brand-new television at that time. I do remember Roy Cohn and McCarthy and Judge Welch and so forth, all during that. Of course, there was just no question in our family, from my mother and father, as to who was right and who was wrong there. The Army was right. That really was a characteristic of my father. The motto of West Point is, "Duty, Honor, Country." That's what you do. It is your duty, as it gets defined and given to you. You uphold and keep your honor, and you serve your country. There was just no question that the Army was in the right here, and that McCarthy must be in the wrong.

02-00:09:09

Rubens:

Were the politics of your family known? Was your father—

02-00:09:12

King:

Yes. My mother and father would vote Democrat. This goes back to the Southern Democrats. By that, I mean not as liberal as you would expect a Democrat to be nowadays. Back before Eisenhower, there were a lot of Southern Democrats who were actually rather conservative people, but were part of the Roosevelt coalition.

02-00:09:36

Rubens:

I was going to ask if they had been supporters of [Franklin D.] Roosevelt.

02-00:09:39

King:

Oh, yes.

02-00:09:40

Rubens:

That's a measure.

02-00:09:44

King:

For two reasons. He's the commander-in-chief—duty, honor, country. That's one reason. The other is that the Democratic Party, wherever, was of course all for Roosevelt. I do have one recollection of the day in 1945 when Roosevelt died. I would have been eight years old at the time, right? No, no, no. Ten years old. I hadn't had my birthday yet, so ten years old. A friend, a playmate from across the street, comes over. They were big Republicans. He announces, "Well, your president is dead now." I thought that was very strange. Therefore it burned in. We were the Democrats.

02-00:10:44

Rubens:

I just have one more line of questioning here. It comes really from thinking about how important the issue over affirmative action was later on in your life. [Washington] D.C. was a segregated city. The Army was still segregated.

02-00:11:02

King:

The Army was segregated, although they were coming off of that.

02-00:11:07

Redman:

What was the discussion about?

02-00:11:08

King:

Episcopal High School was white as could be. I don't think I ever had a black classmate. Now, part of that is that, except for Massachusetts, my schooling from 1941 onwards was in the South. That's how the South was then. I didn't question that at the time. Always, wherever you were—Houston or any other city—there was some section over there that was the black section. You were supposed to stay out of it. I think it came upon me particularly during college, as I just started to think about everything, and then particularly through the years at [University of California] Berkeley, the issues [of] enabling all people

and what methodologies or mechanisms, like affirmative action, you could use to do that. That became a larger and larger issue. It's something that I probably would not at all have forecast myself getting into as of, say, 1950. It's been a very natural thing to do. That's actually been one of the most satisfying parts of this long administrative career, has been finding ways to make contributions on that issue.

02-00:12:56

Rubens:

So I'll turn it back to Emily.

02-00:12:57

Redman:

You had mentioned during the break the honor code at your high school. Can you tell me a little more about that?

02-00:13:04

King:

Sure. There was an honor code. You signed a statement at the bottom of every test you took, saying that this was your own work and you had not done anything improper with regard to what you had put in this test book. It was also well-established that if you saw or heard anything that was against the honor code, you would report it. That was drummed into people. There were some episodes that I did not know of at the time, which actually came out later, involving that honor code with the people while I was there. One is in the works of a very well-known writer, C. D. B. Bryan. He was one of my classmates, and wrote about a specific incident in which he was involved. The honor code was very instilled, very strongly felt. One was pretty careful about it. I think that was good preparation. During this last presidential campaign, John McCain mentioned that honor code several times. It's obvious it made an impression on him, too.

02-00:14:49

Redman:

How did you feel about it? Was it important to you? Did it just seem more like a disciplinary entity?

02-00:14:57

King:

It seemed the right thing to do. All you were being asked to do was to sign something that said: I did the right thing rather than the wrong thing. Well, of course I wanted to do the right thing. In that sense, it seemed perfectly fine to me to have that. I had not participated in the other alternative, so I had nothing to compare it with.

02-00:15:25

Redman:

I assume that none of the other schools you attended had anything similar?

02-00:15:29

King:

No, they didn't. This was the one. My junior high school, just before that, had been a public school in Belmont, Belmont Junior High



School. Before that, it had all been privates, but those privates did not have explicit honor codes.

02-00:15:55

Redman: Why did you study at a public school?

02-00:16:01

King: Well, again, these decisions were not made by me.

02-00:16:06

Redman: Do you know why—

02-00:16:07

King: Well, I think my parents looked into the quality of the Belmont public schools once they decided to live in Belmont. In fact, I believe the choice of Belmont as a place to live related very much to what was the reputation of the school system. That's why we lived in Belmont rather than Cambridge [MA] or Somerville [MA]. There were private schools, some very well-known private schools, in that vicinity, Belmont Hill School being one, Noble and Greenough being another. I think my mother and father looked into that fairly deeply and made this decision. I didn't.

02-00:16:54

Redman: As a student, what were the differences that you saw in public versus private?

02-00:17:02

King: Bigger class in public. Private was smaller. Private was probably more individual attention. And certainly, I think, just simply the quality of education at a place like EHS was far better than it would have been at George Washington High School or Washington and Lee, which were the two big publics in Arlington and Alexandria. So quality of education, degree of challenge, degree of individual attention, degree of individual motivation. Those were all quite good. I'm thinking mainly of EHS, but it's also true of the earlier ones.

02-00:17:46

Redman: Did you find that your time at junior high in Belmont, did you find that that school had comparable—

02-00:17:54

King: Yes. It seemed to me to be stimulating and good. There were some teachers I related with very positively there. But how typical was Belmont Junior High School of the public schools? I don't know. I think it may well have been a cut above what most of the others were. It was interesting to me that my parents, not having a large income, because Army wages were what they were, would put—it is interesting to me in hindsight that they would put paying a private school tuition for my education right up there at the top. They sure did.

02-00:18:37

Rubens:

Did you have a sense of your class position? It was mentioned that your family didn't have that large an income. Were you comfortable? Did you have any sense that there were people that were more well-to-do than you because of your school?

02-00:18:54

King:

It was apparent there were people more well-to-do, and it was apparent that my parents had to do a number of things that were significant with regard to scrimping. One would be, whenever we moved, where's the commissary? Because that's where they would go shopping for food. That would be at a lower rate than nearby supermarkets. They did economize, and there are some ways the Army enabled them to, by virtue of commissaries and post exchanges. The wages were tight. They're not horrible. It's as it is today, more or less.

02-00:19:42

Rubens:

Did they have cultural interests or aspirations for you?

02-00:19:48

King:

Very little of that. I was encouraged to get out there and do extracurricular activities. I suppose that's a start of a lifetime of those. I did do the yearbook. I did the monthly magazine at EHS. I did the dramatic club. We put on a play each year. I had the opening lines of "The Petrified Forest," in a part that had something like six lines throughout the whole thing. First telephone lineman.

02-00:20:33

Redman:

Do you remember which plays?

02-00:20:36

King:

Well, "The Petrified Forest" was one. "The Man Who Came to Dinner."

02-00:20:44

Rubens:

Speaking about race.

02-00:20:48

King:

That's the one that's got Monty Woolley in it. Not "Guess Who's Coming to Dinner."

02-00:20:54

Rubens:

I'm sorry. Okay.

02-00:20:57

King:

This is "The Man Who Came to Dinner."

02-00:21:01

Redman:

Those were the two?

02-00:21:03

King: Those are the two I recall.

02-00:21:06

Rubens: Do you recall going with your school on trips to the Smithsonian or—

02-00:21:22

King: Oh, I went through every inch of all the Smithsonian museums many times.

02-00:21:28

Redman: There was of course not the aero/space—

02-00:21:31

King: No, but the old Museum of Arts and Industries was in full swing then. There was that, and there was the Museum of Natural History, which still stands. Those two in particular. Then there was an Army Medical Museum you could go into. Jars of brains and such things, if that's what you wanted to see. It was more the museums of collections, not art museums. It was the Smithsonian type of thing. I did a lot of that.

02-00:22:08

Redman: What other types of things did you do in Washington, D.C.?

02-00:22:18

King: Battlefields. We went to see Annapolis.

02-00:22:23

Redman: But in the city proper. Did you spend much time there?

02-00:22:26

King: No, not really. Well, I toured the Capitol, climbed the Washington Monument. That was one of the great favorites. Either climb the monument and ride the elevator down, or do it the other way around. That we would do many times. People would come to visit. That's the occasion on which you'd do these things. I probably knew every inch of the Capitol and the Library of Congress. I did use the Library of Congress for some high school composition papers. That was encouraged by the high school. You went in there. Today, you can go into the Library of Congress and you look down from a balcony on to this circular old reading room. That reading room is where I did my compositions. Ordered my books, and my books were brought to me by the library.

02-00:23:29

Rubens: And you must have gone to Congress. You must have gone into the House or the Senate chambers.

02-00:23:37

King: Oh, yes. In fact, occasionally, just sit there for three hours and listen to whatever was going on. Yes. Yes, yes, yes. In that sense, I think

Washington was a very good place for high school. Great awareness of what the government is. Not all of the horse trading and ins and outs of it, but the structure of it, yes.

02-00:24:05

Redman:

Did you find yourself getting more interested in American politics in that time?

02-00:24:12

King:

Yes. Although I've never been out there walking the streets, knocking on doors, participating in campaigns. But awareness of it all, most definitely. The Army-McCarthy hearings were a darn good example of that.

02-00:24:37

Redman:

Did your parents talk more about politics when in that area?

02-00:24:41

King:

No, it was very simple. The Democrats were in the right. If the Army was challenged, the Army was in the right. That's very straightforward.

02-00:24:53

Redman:

Words to live by. If we can go back to talking about your academic interests, clearly, when you were in high school, you started thinking about college. Can you tell me about your very early thoughts about what you wanted out of college?

02-00:25:18

King:

Well, I wanted to go to a good college. Good had to become defined. That related to academic standing. I think I probably did have an interest in the Ivy League from the word go. We had to go through the question of was I going to be interested in West Point or not, and I made the decision on that. I was not. I wanted to do it different, and that was really just to have my own career, separate from what that of my father had been. We looked at the Ivies, and since I could probably do an Ivy, I should do an Ivy. My mother was very encouraging of Princeton [University]. Perhaps too much so.

02-00:26:10

Redman:

May I break in and quickly ask, when you say that you looked at the Ivies, did you actually go and visit them?

02-00:26:16

King:

Oh, yes. We went to Princeton. We went to New Haven [Connecticut]. Those were the two that we visited. I had put New Haven into the picture because I was impressed by the fact that my father had been there in 1929. I looked through—I think it was the literature at EHS, and I discovered there was a special scholarship, called the Greenway Scholarship, that was for a student from EHS who would go to Yale.

So, hey, I could produce some of the financing for my college. I can probably win that thing, and Yale would be a good place. The Greenway part of this is interesting. It's a man named John C. Greenway, who was an EHS graduate, who then went to Yale, and who was an originator of the copper industry in Arizona. He is one of the two statues from Arizona at Statuary Hall in the U.S. Capitol. He was that well-regarded in Arizona. Arizona came in [as a state] in 1910, and he had that standing back there in 1910. His estate had created the scholarship. The scholarship was probably as persuasive as anything. Plus I liked Yale when I went to New Haven. I guess the rest of New Haven didn't come on at me as it does to many other people nowadays. New Haven is not as handsome surroundings as the environs of Princeton are.

That was the logic, plus I knew Yale had engineering. I did not, at that time, know anything about the history of engineering at Yale. That's something I've actually been involved in since then, and didn't list on my list, but I was on University Council at Yale for five years, which was a very interesting experience. It's '88 to '93. Engineering, in fact, has had a checkered history at Yale. They [Yale] had never been quite sure that they really wanted it. Does engineering belong in a real liberal arts college? But in my day, it was a separate school. I don't know if you're wanting to get into Yale at this point.

02-00:28:53

Redman:

Not yet.

02-00:28:54

King:

Okay, we'll wait.

02-00:28:57

Redman:

Do you remember around what time in your high school career that you discovered this Greenway scholarship?

02-00:29:05

King:

Probably sometime around the end of my junior year. The question, where was I going to go to college, was the next question to be dealt with, and so I developed an information base.

02-00:29:23

Rubens:

Why was your mother pushing Princeton?

02-00:29:26

King:

It's Presbyterian by origin, and that may be one reason. It's smaller. I think the less urban location probably was another factor.

02-00:29:39

Rubens:

It was a good feeding ground from the South, too. It was known as a Southern school.

02-00:29:45

King: And there had been traffic from EHS to Princeton, too. Maybe not as much as Yale, but significant.

02-00:29:54

Redman: Before discovering the Greenway scholarship, were you seriously considering other Ivies, probably?

02-00:30:01

King: I applied to one other college, I think. I may have applied to Princeton, too. I did apply to Princeton. So three I applied to. The third one is Cornell [University]. Exactly why Cornell, I'm not sure, except I believe probably Mr. Tompkins told me that was a good chemical engineering program. The whole Cornell experience is an interesting one. I never visited there. It was a very well-known and well-established chemical engineering program at the time. It stood by itself in requiring a five-year degree. I didn't want a five-year degree. That's what dropped Cornell.

02-00:30:56

Redman: Okay. But you still applied?

02-00:30:58

King: I applied, and I was admitted and received a special letter from the chairman of the department. Although I guess he was the head of the school. I think that was a School of Chemical Engineering. It [Cornell] was by far the most personalized in coming back to me, but the five years—didn't like that idea. In hindsight, I think it would have been wonderful, by the way.

02-00:31:26

Redman: You seem to imply that when you were making these decisions, that you were pretty adamant about not going to Princeton. Why?

02-00:31:35

King: To Princeton? Well, I'm not sure I was adamant against going to it. If adamant applies to anything, it applies to West Point. I just did not want the regimented army life. The idea of orders sending you somewhere else. I would often see my parents—they knew the orders were about to come. They'd have no idea of where the orders would be to. Then the orders would come, and it would be to some place. The reaction would be either very positive or very negative. They always wanted to be assigned to the Presidio in San Francisco. Never were. I think my father had probably requested it at times. They never got there. There seemed to be a certain lack of control of your life associated with this. That was one of the reasons against West Point, in addition to just being different. Princeton—probably a significant amount is reaction to being pushed there by my mother. I think I had a feeling that, with this Greenway scholarship, here's something I could

do, and it would be me. It was this thing that I did that was going to be taking me to Yale.

02-00:33:05

Redman: Were you at all concerned when you learned that four other students from your high school were going to Yale?

02-00:33:13

King: That was good.

02-00:33:14

Redman: Well, in terms of getting the scholarship.

02-00:33:16

King: Oh. I was pretty sure I would get it. I had the best grades of the bunch.

02-00:33:25

Redman: Interesting. I assume that that process, you needed to be admitted to Yale and then you would apply for this scholarship?

02-00:33:32

King: Yes. I've forgotten whether I applied through Yale or applied through the high school. I'm not sure.

02-00:33:38

Redman: Were there any other stipulations on this scholarship? I assume that you needed to maintain a certain grade point, but was there anything else?

02-00:33:49

King: No. It's just that it had to be somebody who was going from Episcopal High School—it's a limited field—to Yale. That's even more limited.

02-00:33:59

Redman: But you could study anything that you wanted?

02-00:34:01

King: I believe so. Possibly it preferred engineering, but I don't believe so. I've actually, a few times since, tried to look it up on the web. It seems that it doesn't still exist. It must have been a term gift rather than an endowment.

02-00:34:19

Redman: Okay, interesting. Were you later involved with any future recipients of this award?

02-00:34:30

King: No, I was not. Which maybe says something about me. I didn't seek out future recipients. Here's an interesting thing. The future recipients would have been four years behind me, because only one person could hold this at a time.

02-00:34:52

Redman:

I see. I see. Okay. So you kind of lucked out that—

02-00:34:56

King:

Yes. It was coming up the right year. That was another thing.

02-00:34:59

Redman:

Very, very interesting. I know that it is hard to say, but were you sufficiently taken with Yale that you think that you probably would have chosen to go there even without the scholarship? Or is that just something you simply can't answer?

02-00:35:15

King:

The scholarship certainly helped. Given the family's circumstances, the economic circumstances, I think the fact that I had this scholarship, rather than laying the whole bill on my parents for one of the others or for Yale, was a positive thing. If you asked me if the scholarship didn't exist, would I have gone to Yale, I probably would have gone to Yale or Princeton.

02-00:35:49

Redman:

Okay. Were your parents disappointed that you didn't want to go to West Point?

02-00:36:00

King:

Not visibly. I suspect my father may have secretly harbored a desire. My father was not terribly expressive on these things. My mother, at one point, I think had been very interested in my going to West Point, but that relaxed up. That wasn't there as the real decisions were being made.

02-00:36:30

Redman:

Did you feel any obligation to be involved with the military?

02-00:36:39

King:

No.

02-00:36:39

Redman:

Was there any pressure from your family?

02-00:36:43

King:

No.

02-00:36:43

Rubens:

ROTC was—

02-00:36:44

King:

ROTC did exist then, and I didn't do ROTC. I didn't want to do the military. I wanted to lead another kind of life.



02-00:36:57

Redman:

And you didn't see any disappointment from your parents. Did they encourage you to stay away in any sense?

02-00:37:06

King:

Encourage me to stay away from the military? No, I don't think so. That one was a choice for me to make.

02-00:37:18

Redman:

That's interesting in how much input they had in so many other areas—

02-00:37:21

King:

Well, there are negative aspects to the military life, too, and I think they recognized those. The transientness. The no control over where you go or what your assignment is. I think the negatives sufficiently balance the positives. It was not all that big a deal.

02-00:37:50

Redman:

Did your parents ever visibly express any concern about the impact on you moving around so much?

02-00:37:59

King:

The impact on me?

02-00:38:00

Redman:

On you, having to move around so much.

02-00:38:03

King:

Yes. I think that was recognized to be difficult for me, but it was not a big deal. It was a third priority issue. But yeah, they would bring it up from time to time. And I did find the new adjustments difficult. There's just no question about that. Because everybody else is there and knows each other. Now you walk in one day and you're part of this. Only you're not part of it, and you have to work your way in.

02-00:38:36

Redman:

Did you find that you ever got used to it? Did you get better?

02-00:38:40

King:

Yes, I got better.

02-00:38:42

Redman:

So there is something to learn with that.

02-00:38:45

King:

Yes, I think so. It served me enormously in later life. There's no question about that. We had this one earlier, but I think a certain number of moves are a good thing, for just that reason. Developing that hardiness in your self.

02-00:39:02  
Redman: I assume that you barely batted an eye moving up to New Haven and starting a new chapter in a new place at that point.

02-00:39:10  
King: Gee. Big fun!

02-00:39:13  
Redman: And you knew you could stay for four years, so it was lots of stability. Interesting. So before deciding on a college, did you have any correspondence with faculty or students, I guess at Princeton and Cornell and Yale?

02-00:39:33  
King: As I mentioned, the head of the department at Cornell sent me a very nice welcoming and encouraging letter, which was—

02-00:39:40  
Redman: But after applying?

02-00:39:42  
King: Oh, after applying? To try to recruit me, so to speak?

02-00:39:47  
Redman: Had you been reaching out to any faculty or did you know students at Yale? Did you have any correspondence before applying?

02-00:39:56  
King: The answer to that is no. I went in cold. All I had done was go during the season where you go and look at colleges. I had done the thing one does through the admissions office. Been taken on a half-hour tour of the campus by somebody and had my interview. That's all I'd done. That was the admissions office. Nobody with the academic end of things at all.

02-00:40:21  
Redman: Did you know anyone who had gone off to Yale before you?

02-00:40:26  
King: No.

02-00:40:32  
Rubens: Did it matter to you at all that it was another male institution?

02-00:40:38  
King: Didn't cross my mind really. EHS was one of those, too. Belmont Junior High had been coed. The school I went to in Virginia during the Fairlington years, right after World War Two, that had been all-male, too. Saint Stephen's. Kincaid [School] in Houston was coed. But anyhow, it really didn't occur to me one way or the other. Colleges were either men or women. I was male. I would go to a man college.

02-00:41:29

Redman:

Did you do anything special the summer before to prepare for college?

02-00:41:35

King:

No. The summer before Yale—I'm trying to remember what that was. Oh, yes, I know exactly what it was. I spent that in New York City. No, wait a minute. Summer before Yale. It was '56, my senior year at Yale, I spent in New York City. Summer of '52, I think, was a camp counselor year. That was my one year as a counselor at Camp Red Cloud.

02-00:42:06

Redman:

Were you, that summer, assigned a [college] roommate?

02-00:42:10

King:

Yes. I didn't know any of my roommates. I just ended up with who I ended up with there. There were three of us. One, a fellow from Meriden, Connecticut. The family did not have high income. I've forgotten what the occupation of the father was. Now I have to eat my words, because the other roommate was Evan Houseman, who had been at EHS. We did ask to room together. I have to go back on what I said before. I had forgotten about Evan's background. Evan was out of the Army. Not the Signal Corps, however. Some other corps. I had known him through EHS, and he was also a day student. He had been a good friend there. It was not a matter of deciding together to go to Yale. It was a matter of, once we knew that we were both going to Yale, then we decided to ask to room together.

02-00:43:23

Redman:

Did you know anything about his experience at Yale before going—

02-00:43:28

King:

He was a freshman when I was a freshman.

02-00:43:30

Redman:

Oh, I see. Okay.

02-00:43:32

King:

So we entered at the same time.

02-00:43:34

Redman:

Okay, interesting. Those were your only two roommates?

02-00:43:40

King:

There was a third one. The fellow from Meriden, Connecticut, whose father was—I want to say something like a silversmith, but I'm not sure of that. If I was a day student in high school, he was a week student at Yale. He went home every weekend to Meriden. He was less integrated into it all than we were.

02-00:44:17

Rubens:

I did have a question about Westerners. Yale made an effort to get boys from “the provinces”.

02-00:44:25

King:

Yes, they did. There was a real Californian who was among my good friends as a freshman. Yes, Yale definitely did that. They tried to draw from all states and made a big thing out of that. There was an effort to brew and blend an incoming class. There were people from everywhere there. That was fine. That was good. And for the first time, some black students, too. Not a lot. I think there were probably three in my class of eight hundred. I don't know what may have been special with regard to these people. I think there were actually four in my class. One was from a family—his father would have been a doctor. Another was from a family that was well-off rather than in poverty, and whether this is true of all of those in my class, I don't know. But there were a few. Four out of eight hundred.

02-00:46:22

Rubens:

Just to pick up, in trying to tie up some loose threads, I was trying to think about the American culture at the time of the late forties and into the early fifties. I know there was a lot of science fiction novels that had grown out of the thirties. I think it was the beginning of some of the science fiction films. Were you interested in—

02-00:46:46

King:

No, I wasn't interested in science fiction. I've never been interested in fiction much. I love *Gone With the Wind*. That's fiction. But by and large, nonfiction has been what I want to read. That continues today. That didn't have much effect on me. I knew who Isaac Asimov was. It just never drew me in. I was a reader of all sorts of things from the word go. I was encouraged by my parents. I'd even get these prize books, I mentioned, from EHS. *Vanity Fair* was one of them. I read *Vanity Fair*. They gave me a prize book. I should read my book, right? There was just no question to that. So I read all of these things from way back when. I continue to do a lot of reading. Among other things, I think it probably gave me an ability to read relatively fast—not speed reading, but fast—and obtain the understanding from that read. Of course, when you get into jobs like provost here, and at the system level, you've got to do a lot of that. I think that was developed early on through the reading interest.

02-00:48:38

Rubens:

This is a silly question...

02-00:48:41

King:

Oh, they're the best.

02-00:48:42

Rubens: Did your father wear a uniform?

02-00:48:45

King: Well, to work, yes. Sure, in the Pentagon, everybody had a uniform on.

02-00:48:51

Rubens: I didn't know once you became—

02-00:48:52

King: Yes. His primary attire was a uniform. Weekends would then be an open-collar Army shirt and Army pants. His clothes were the Army clothes.

02-00:49:08

Rubens: Would he take you ever to the Pentagon?

02-00:49:14

King: We would have dinner out at least one night every week. Yes, indeed, we went to the Pentagon cafeteria that one night, every week during the Pentagon years. That would have been '46, and then some of that again during high school. Sure. And then Howard Johnson's when we lived in Belmont. But anyhow, with regard to involvement in Army activities, not a lot. Mind you, he was overseas for all of World War II. If he went into his office on a weekend at the Pentagon, I would go in. I would be let in. Can't do that today. I would explore the five shells of building, and the five floors, and the five sides of the Pentagon and all of that. I did do that. One of the nicest things he did comes later than this period, which is after Jeanne and I are married. We are in Connecticut, and it's what's called June Week at West Point, which is when the alumni come back. Jeanne and I drove over from New Haven to West Point and met my father, who was coming up from Princeton, and watched the review with him. Afterwards, he takes us down—my son is with us, too—and introduces us to Omar Bradley. He did a couple of things like that. Bradley is probably the highest one I ever met this way.

Interview 2: May 5, 2011

Audio File 3

03-00:00:01

Redman:

Jud, in our last interview, you discussed your childhood and early education. In this session, we'd like to move into your time at Yale. You have already told us a bit about how you chose Yale, and even a bit about your first roommates. I'm first interested in learning a bit more about your first impressions of the institution. Often, the first days and weeks are some of the most memorable in one's college experience. Can you tell me about some of these?

03-00:00:46

King:

Oh, sure. Yale was my first extended experience away from home, other than the summer camps. It had all of those attributes. Yale also puts all the freshmen together on what's called the Old Campus. They're very old buildings that surround the edges of this block. That's the Old Campus. All the freshmen are there. I was in a dorm called Durfee Hall. There's instant mixing and knowledge of other freshmen, which was, I thought, very, very effective. I had the usual first thing away from home thing. Learning the fact that they would sell liquor to people at age eighteen. Finding out how best to handle that. So one impression was of a very, very interesting place. A very stimulating place. Courses, taught by quite impressive people in quite impressive ways. Yale, even for freshmen, does have a lot of breakout sessions, or small group discussions. I had some of those in my first year. I thought that was very good. Then, with it being totally residential, and the freshmen all together, there were all sorts of things of a social nature that started up and worked out. You also eat together. The whole freshman class ate at what's called the Commons of Yale, which is a big World War I building. I thought the mixing of others, the finding of these people, having come from all sorts of places, including California, was very good. In a sense, a very facilitated transition.

03-00:02:42

Redman:

Now, you said that the buildings sort of circled a square. Does that mean that the freshmen really had their own campus? Did you take classes separately from the other years?

03-00:02:54

King:

Some of the classroom buildings were on the Old Campus, but very few of the actual classes were. There's Connecticut Hall, which is one of the original buildings, which has a statue of Nathan Hale out in front. That did have some courses, and yes, I had discussion sessions that I remember in there. But by and large, it's a quadrant of land, enclosed by city street, so it's one city block, one complete city block,

with the buildings all around the outer edge of it, the interior being outdoors, mixing area. It's also where the commencement ceremonies are held. Then your classes would be in other buildings elsewhere on campus. You'd walk off to them.

03-00:03:41

Redman:

So you did have some interaction with other years?

03-00:03:44

King:

Yes. Although, the way it goes, in my day, after the freshman year, you then were matched with one of the residential colleges. You then were going to live in it for the next three years. You could have some classes within the residential college. That's an aim of the residential college system. It doesn't work very well for an engineer, whose courses are not going to be ones that are taught within the college. The idea is the transition will be to the college. You had to make your choice of college without much experience during the freshman year. There were not ways to go visit this college, that college, the other college. Now that is the case at Yale, because your meal tickets are not just for your college or for the commons. They are portable to any dining room. You could go take yourself and some friends off to some other college and mix with them, find out about the college and so forth.

03-00:04:54

Redman:

This is skipping ahead a bit, but how did you pick your residential college after your first year?

03-00:05:01

King:

Ah. Two factors: proximity and friends. With regard to proximities, the sciences at Yale are up on what's called Science Hill, the top of Prospect Street, and it's a long walk from any of the colleges, but it's a shorter walk from two of the colleges, which are Silliman and Timothy Dwight. I then joined with friends in deciding what ones we would apply to so that some friends could stay together. Actually, we ended up rooming together. The set of roommates came from that. We picked Timothy Dwight. It was the smaller of the two colleges, which seemed a good idea. Silliman was the largest college, both in grounds and in numbers of students in it. Stick with the smaller one might be better. That was it. Timothy Dwight College, applied to it, got it.

03-00:06:01

Redman:

And you were there for the following three years?

03-00:06:03

King:

Yes.

03-00:06:05

Redman:

What were your first impressions of New Haven? Did you spend much time in New Haven?

03-00:06:12

King:

Yeah, because the way Yale is laid out, there are streets of New Haven that cut through it in both directions. A lot of New Haven traffic, both automobile and people, foot traffic, come through the campus on these streets. It's sort of mixed with New Haven. It's not an isolated campus. There's no fence around it. To do things like banking or buying clothes or anything like that, you're out in the city. So I did mix with New Haven. New Haven is a different sort of city. It was not then what it is now. That's another thing. It's changed over the years. New Haven is a city that has had a growing immigrant population, largely Puerto Rican. It's had a lot of urban problems. In more recent years, Yale has joined with the city in trying to address these problems. They do a number of things jointly. I think Yale has the general belief nowadays that it may be the nature of the city of New Haven that's most limiting to the university. I wouldn't say that was really true in my day. That situation hadn't developed. But one didn't mix out in the city much. Really all of your friends and contacts and social life were Yale rather than the city of New Haven. It's an industrial Eastern city with a very disparate population.

03-00:07:50

Rubens:

I thought it had a big African American population when Kingman Brewster was the—

03-00:07:55

King:

Not so much as Puerto Rican. For some reason, New Haven has been very attractive to the Puerto Rican community.

03-00:08:03

Rubens:

You may be asking this, but I don't know how large Yale was, the undergraduate and graduate. Do you have a sense of what it was?

03-00:08:11

King:

Yes, my graduating class is eight hundred people. On the campus at any time would be of order of thirty-five hundred undergraduates in those days. Now, it has grown since then. I believe it's now up to about twelve hundred in a graduating class. That's the size. The other parameter is that the graduate school is at least equal in numbers to the undergraduate school. Maybe eight thousand total on the campus in my day.

03-00:08:44

Redman:

You have clearly attended your fair share of schools. Was college what you expected it to be?



03-00:08:52

King: Was it as hard as—

03-00:08:54

Redman: Was the experience as you anticipated?

03-00:09:00

King: There was no shock of difficulty of courses. I know that's often a college experience for people. I think that may have related to EHS being a fairly severe school academically. The intensity and nature of the courses and homework was not a great change from EHS. I think one thing that struck me—engineering is actually a pretty small component of Yale. There have been issues over the years as to whether engineering should continue to exist at Yale. I've been involved in those issues some in later years. Most everybody else was something other than a scientist or engineer. This, with the intimate mixing of people, I think the thing that was probably most different to me was finding myself in discussions of all sorts of esoteric subjects. Chewing over the news in the New York Times for the day, and all the ins and outs of it, whatever was going on with somebody who was majoring in English or in psychology or whatever. That was an aspect that I hadn't quite expected as much. Actually, I think it was an enormous value, in hindsight. I've had a growing concern over the years that engineering education is too narrow and that it's important for engineers to start off with all the elements of a liberal education, which, now, in my mind, translates to the fact that engineering should be a professional degree at the graduate level rather than the undergraduate level. It's the one profession that isn't that. I've carried that [issue].

As I look back on Yale, the opportunity to take these courses in all of these interesting other areas was very limited. I think I had one elective course, possibly two, in my four years. The one I remember taking was a big large lecture, taught by a very popular professor in political science, on comparative governments of different countries. Why I picked that, I don't know. Probably the fact that the professor had such a large name. But that was about all. All the rest was prescribed there in the engineering curriculum and the sciences and math that led up to it. These interactions outside the classroom with all these people who were living in the residential college along with you, that was where the broader education came from, which is interesting.

03-00:11:54

Redman: So you got your liberal arts education from your peers.

03-00:11:57

King: From my peers, not from my classes, yes.

03-00:12:00

Redman:

Interesting. Do you know—I'm just curious—is that still the case at Yale?

03-00:12:06

King:

No, it isn't. It's been a very interesting story. I had twenty-one chemical engineers in my graduating class. Yale has never had numbers like that since. A rather few years after I graduated, Yale did away with the separate School of Engineering and put the engineering departments within Yale College, which meant they had to meet the requirements of Yale College. Those, of course, were a number of breadth requirements. Yale actually went through, a number of years after my time, [a period] where an engineer just couldn't complete in four years because of all the breadth they had to do, and the engineering. Then there was a while when Yale wasn't accredited in engineering by choice, because they wanted to keep the bachelor's[-level] degree and just couldn't cram all of this stuff that the engineering accrediting agency would want into the undergraduate curriculum. Then, during the time that I was on University Council, which we'll come to later, Yale very nearly did away with engineering fully. That was, in fact, the recommendation of a university-wide committee that had been formed. They didn't. They brought it back. Actually, engineering is now in better shape at Yale than it's been since my time. I don't think it's in better shape than it was in my time, but it's a lot better than it has been recently. It's been a very checkered history for engineering at Yale—and Harvard. Both universities have had great issues of, is engineering part of the true academy?

03-00:14:03

Redman:

Do both Yale and Harvard, did they, throughout the course of this ongoing discussion, have a graduate-level engineering program?

03-00:14:10

King:

Yes.

03-00:14:12

Redman:

That wasn't part of the conversation or it was?

03-00:14:22

King:

The recommendation, as I recall, at the time in the early nineties, was to do away with engineering, sociology, and linguistics. Wow. So if they had done away with engineering, you would do away with the engineering faculty. Therefore, you would do away with the graduate program. Yeah, the whole thing was threatened. Yes, there's been graduate engineering at Yale. That's another story. But it's not been as depleted in students as undergraduates have. There was a period when I first went onto the chemical engineering department advisory board at Yale, when they had two seniors per year. The enrollment was down to that.

03-00:15:05

Redman:

Could you clarify for me, when you were a student at Yale, what the organization was? Where was chemical engineering within the larger university?

03-00:15:17

King:

There was a School of Engineering, and chemical engineering was a department within the School of Engineering. The School of Engineering had a dean. That meant the organization was like it is here at Berkeley. If you went to see the dean about something, you did not go to the dean of Yale College. You went to the dean or associate dean of the School of Engineering. That was the organization in my day, and that's what got changed very soon thereafter.

03-00:15:48

Redman:

Before we jump into your academic experience, you began school in 1952, which was an election year. How involved were you in following that? Also, what was the atmosphere like on campus?

03-00:16:03

King:

You've got a good one there. Well, I remember going to see Adlai Stevenson twice as he came through New Haven. Once, he was speaking on the green, and I even have pictures that I took there. I was very interested and involved. Then, along with quite a lesser number of my Yale classmates, I trudged down to the New Haven railroad station to see Adlai when he came through a second time. He spoke from the balcony of the railroad station, overlooking the interior of it. I was interested, aware, and involved. Oh, I can't say that's the first election I came intellectually alive in, because I was certainly aware of 1948, too. I was aware of the [Harry S] Truman/[Thomas E.] Dewey thing. Not as much as in '52. '52 was my dawning of political awareness.

03-00:17:32

Redman:

Would you say that that, in part, has to do with being in such a vibrant intellectual community or was it just a matter of age?

03-00:17:40

King:

Well, my peers were all interested in this, too, so yes, I think it does have to do with the nature of New Haven. I think there's a direct connection there.

03-00:17:53

Redman:

Did you find that students generally were somewhat homogenous in terms of political views or were there contentious debates?

03-00:18:01

King:

Oh, no. Yale was quite split. There was something called the Yale Political Union. I wasn't in it in the sense of being a doer and a molder of what they did, but they did put on speakers. I would occasionally go

to hear a speaker in the Political Union. No, there was a strong Republican element. There was a strong Democratic element. Probably much more balanced between the two parties than one would think of on college campuses today.

03-00:18:39

Redman:

How would you characterize the political atmosphere of the campus after the election? Not leading up to it, but after.

03-00:18:53

King:

I don't think anybody was surprised by the fact that Eisenhower won. That was more or less a given that that was going to happen, being who he was and with the background that he had. In terms of there being some kind of reaction to the election, no. I think general acceptance. Remember, these are the kids of the fifties. We were different. We were not the activists.

03-00:19:20

Rubens:

If I could just ask one question, your years were basically the years that Berkeley, a little earlier, was going through the loyalty process. Was there anything like that at Yale?

03-00:19:31

King:

No. That issue did not make its way to Yale. Aren't the loyalty oath years a little later in the fifties?

03-00:19:41

Rubens:

Earlier, 1949 - 1951.

03-00:19:55

King:

That issue did not make it to New England.

03-00:20:03

Redman:

You just brought up the Army/McCarthy hearings, and you had mentioned that a few times in the last session. I'd like to dig a little deeper here, since that's when you were in school. Can you first, just for the record, describe what these hearings were?

03-00:20:24

King:

Senator McCarthy had made a big case of improprieties relating to communism within the Army. He and his council, Roy Cohn, held hearings, where people from the Army were brought before the hearings. I think the secretary of war at the time was a man named [Robert] Stevens, who got called in. I believe I remember him testifying. These were televised. They were glued to the television, daytime fare, during the years around 1954. The country was just riding with bated breath on this, particularly our household, since, as I described, my household had an interest in the Army.

03-00:21:32

Redman:

Do you recall what the general attitude on campus was towards these? Interest, it appears, but can you be more specific about that?

03-00:21:45

King:

There was some of everything on campus. Remember, I'm there not so long after Bill Buckley. Bill Buckley had just graduated when I entered, and I think some disciples, so to speak, of his were still there, active in the Yale Political Union and the *Yale Daily News*. There was a strong conservative force present at Yale that would be backing of Senator McCarthy. There was surely also an array of people who felt that McCarthy was way off base and doing the wrong thing. So it was all there.

03-00:22:27

Redman:

You had mentioned in particular that your mother and father were ardent supporters on the Army side. Was there a fear that McCarthy wouldn't be discredited, or were they convinced that, ultimately—

03-00:22:48

King:

I think the fear was that the Army would be discredited in some improper way. That was probably the main concern in mind within my mother and father. There were surely also those who wanted to see McCarthy get his comeuppance. As I remember, Judge [Joseph] Welch got a lot of empathy from people with the way he handled the situation. He was, in a sense, the first real obstacle that McCarthy ran into.

03-00:23:30

Rubens:

He kind of broke him, didn't he?

03-00:23:31

King:

Yes, by what he allowed him to do, and stopping him from talking at certain times and so forth.

03-00:23:39

Rubens:

"Have you no shame?" [Welch's retort to McCarthy.]

03-00:23:41

King:

That's right!

03-00:23:48

Rubens:

I don't know if I'm interrupting. Was your father concerned about communism, though? Not that it was in the Army, but that it was a concern?

03-00:23:58

King:

I would say not a primary concern, and I don't even know that it was a concern, other than that, as the Cold War got underway, communist equals Russia were the adversary, and so the Army had to think of

them that way. In terms of communism overrunning the country, I don't think that was a particular driving force for them. It was the unjustified attack on an almost sacred institution of the U.S. government.

03-00:24:39

Redman:

I'm also interested in any observations that you have, any memories that you have, of the Brown v. Board of Ed ruling, which happened around the same time. Was this something that was discussed much on campus? I'm particularly interested because you mentioned in the last session that most of your schooling was in the South, and I'm wondering if this made an impact on you at the time.

03-00:25:06

King:

I'm trying to remember. I was certainly aware of that when it happened and very interested in the issue. I guess in terms of personal commitment, I was still, at that time, torn between what I thought were the proprieties of Southern upbringing. I do remember having been given a [Richard] Russell button in 1952, which I found a few years ago, sitting in one of our curios boxes at home.

03-00:25:40

Redman:

Can you tell me what that is?

03-00:25:43

King:

Richard Russell was the senator from Georgia and was the Dixiecrat candidate for various things. I think at that point in my life, I had not engaged the issue well. I had not spent enough mental time and wrapping myself around it. I had my Southern upbringing, and it did look, to some extent, like people were pushing things on the South. That, of course, came out of EHS. That sort of thing would be said there. But then I did also become aware of the rights of people, and I had a fairly good friend who was one of those four or five African American students in my class. There he was, and there was the whole issue of socializing there. I think I was starting to come to something that slowly and by degrees became an issue within my life. By the time I was a department chair here, which I actually did fairly early on, I think was very much aware of the need to bring race relations and equality of opportunity into a much better mode. That just grew as time went on. Of course, then I was administrating these things, and then finally ended up catching regents resolutions SP1 and SP2 right after they were passed.

03-00:27:33

Redman:

Would you say that you had a similar response, I guess, to things like the Montgomery bus boycott? Seeing sort of a civil rights—

03-00:27:44

King:

I was aware of those things. I saw that students were doing it. I never felt a desire to go do something like that myself. Of course, if I were to look inward on that, I have to ask myself whether that's a result of not being there politically yet or being an engineer. Engineers don't tend to do those things. I think it was the latter.

03-00:28:11

Redman:

That's interesting. Speaking of engineering, let's get back to your academics. First question, do you remember what courses you were enrolled in, in the first semester?

03-00:28:28

King:

I can do three of them. Well, those three were second-year calculus, because I'd had the first year at EHS. One was chemistry, and there's an interesting story attached to that. Another was freshman English, which was taught by a man who was a veteran and who had to walk on crutches. The fact that he had to do those things and yet was a professor at Yale made, I would say, a positive impression on me. The interesting chemistry story is that I had a teacher, Chester Hargreaves—I remember his name—and after the first or second test, midterm test, within the course, he was impressed by how I had done on the test. He calls me in and asks me what I intend to major in. I proudly said, "Oh, chemical engineering." And darned if he doesn't try to talk me into majoring in chemistry, which I resisted. I thought that was kind of odd for a professor to be doing that. Now as I look back on what the university is like and all these things, it's not surprising at all. That to me was not an expected thing at the time, that he would try to switch me out of this major I had so carefully matched myself with.

03-00:29:58

Redman:

So you were, at that point, already very sure that what you wanted to do was chemical engineering, despite, as you said before, that coming out of high school, you weren't really sure what chemical engineering was?

03-00:30:10

King:

That is true for 98 percent of all chemical engineers who ever were. They didn't know what it really is before they started it.

03-00:30:19

Redman:

But you were stubborn. You were convinced that this was—

03-00:30:22

King:

I was convinced it was the right major. I mentioned last time that one reason was chemistry plus math equals chemical engineering, therefore you do it. But there's more to that. My father was obviously an engineer, and I had a feel for what engineers did in life. I knew enough to be thinking about whether I wanted to spend my life

thinking science and doing science, or trying to use science in useful ways. I picked the latter, which I thought was better. In hindsight, that doesn't match professorial work in a university all that well, but let's leave that aside for the moment. It was both the utilitarian aspect of the discipline and the fact that I had taken completely this advice that the things I liked to do would match chemical engineering.

03-00:31:27

Redman:

Is there a time that you can point to that you started to see chemical engineering as its own discipline and not one that's just made up of chemistry and mathematics? Or was that just a really gradual discovery?

03-00:31:46

King:

There are some generic things here, and it's something we've wrestled with in engineering over the years. The typical engineering curriculum does not expose you even to an engineering course until perhaps the second semester of the sophomore year or the first semester of the junior year. That's leaving aside things in my day like statics and dynamics and strength and materials, which were sort of fundamentals underlying engineering, but aren't engineering. I think my first engineering course would have come the second semester of my sophomore year. Certainly, as I got into the beginning of the junior year, I had a good vision of what it was about, and what these people would do, and what the possible employment situations for the future would be. I will remark, too, and maybe we want to get to this later, that chemical engineering and the use of chemical engineers has changed enormously during my career. The profession, as I started out, was very much matched with the oil industry and the chemical industry. The profession today puts people all over the place with regard to what they do.

03-00:33:10

Redman:

Would you say that your initial plan for your education changed over the course of your four years, or did you stay pretty much on track with where you thought you would be?

03-00:33:24

King:

Certainly, during Yale, I stayed on track. I would probably answer for my entire educational career that I stayed on track.

03-00:33:39

Redman:

You mentioned in the last session something about sort of starting to be a bit more self-aware and thinking about larger questions. Would you say that you developed a philosophy of education while you were in college?



03-00:33:56

King:

I don't believe I did. My own philosophy of education really started developing while I was at the chemical engineering Practice School of MIT. That threw me into a line of educational approach that served me very well in the early part of my academic career, namely case studies and case problems. I think I got there because of having done the Practice School assignment, which we can talk about when we get there.

03-00:34:42

Redman:

In terms of the chemical engineering department, you mentioned that it had a bumper crop the year that you were there, but it was still a small department. Was there a sense of community in this department?

03-00:34:56

King:

There was very much a sense of community. There were only five faculty. The students got to know each of them very well. The chemical engineering students tended to get to know one another very well, do things together, et cetera.

03-00:35:12

Redman:

I assume that that probably extended outside of the actual chemical engineering building, since probably most students made the same similar choice—

03-00:35:21

King:

Sure. If the question is, whom did I go with to hockey games, for example, that would probably be people from Timothy Dwight College, but there were also some chemical engineers who were in Timothy Dwight College. That would be a particularly likely answer to your question. Roommates and fellow chemical engineers from close by.

03-00:35:49

Redman:

By the end of your time at Yale, did you have an assortment of friends from all different departments, all different majors? Or did you end up mostly associating with chemical engineers, or scientists in general, I suppose?

03-00:36:02

King:

I broadened out in one way, which is not as much broadening as you're probably looking for, but is broadening. That was with regard to extracurricular activities. I did get into something called the Yale Scientific Magazine, which is a totally student-run magazine. It has the interesting history of having been started by—Lee De Forest, I think, is the name. He was one of the pioneers of radio. A very well-known name at the time. There was something that was for scientists and engineers, by scientists and engineers. I got involved with that. That brought me into contact with people, some of whom were not even

majoring in sciences, but who were majoring in all sorts of things. That was another community.

Then, I think the other community was intramural sports, which was a big thing. Very emphasized at Yale then. Each residential college had a team in whatever. Now, with it being just the residential college, a hundred people rather than eight hundred, there was more likelihood of your being able to make the team. Tennis was one that I played, including some intramural tennis matches there. Just to finish extracurricular activities, a great large thing was the annual Tang Trophy competition between Timothy Dwight and Silliman Colleges. The Tang Trophy occurs shortly before commencement. There's a team of four from each college. You all have a large glass of beer in front of you. It runs like a relay. You have the first person, the second person, the third person, and the fourth person. Everybody chug-a-lugs his glass of beer, in sequence like a relay. Whoever does it in the shortest time, that college wins. Great big event. Hugely attended. I discovered that one of my great accomplishments in life is to be able to swallow an entire glass of water without pausing in any way. I just pour it down. So I was very good at the Tang Trophy.

03-00:38:46

Redman:

You didn't let those guys at Silliman win, did you?

03-00:38:49

King:

No, I think we won my senior year.

03-00:38:53

Redman:

Good to hear. So you were able to have other communities in the university, not just in chemical engineering.

03-00:39:02

King:

Yes. I think that's very important. Let me start this story a somewhat different way. I've had my fiftieth reunion. That was back in 2006. On the occasion of the fiftieth reunion, a book is made up with statements from every one of the living classmates. I was very struck in going through that book by a statement from one of my friends, who had been on the Yale Scientific Magazine. He started his essay off by saying, "I missed my Yale education. I majored in engineering." Let's go back to that one, because where was the Yale education? It wasn't in the classroom, given the rigorous requirements of the major. It was with all of these people in all of these other ways, in a twenty-four hour experience every day. Weekends, too.

03-00:40:00

Redman:

This might be a nebulous question, but you had mentioned in the last session, you had kind of joked that you weren't much of an athlete, but you talk about these intramural sports. Did you enjoy them?

03-00:40:15

King:

Oh, immensely. I enjoyed them, yes. That was true of the soccer on the frozen ground at EHS, and that was true of the tennis matches at Yale, too.

03-00:40:25

Rubens:

I wanted to ask about one more extracurricular. The Yale School of Drama opened, I think in '55. You had done some acting in high school. Did you go to plays? Were you interested in theater?

03-00:40:43

King:

I went to them. I never went the direction of trying to be in something that the "dramat," as we called it in those days, did. We would go to their productions. Probably even had to buy a ticket to do that.

03-00:41:05

Redman:

What were some of your favorite courses? If you're anything like me, I had categories when people asked that question.

03-00:41:15

King:

I think my answer to that question would have more to do with the teachers than with the course content. If I liked and related to the teacher, that's going to put the course on my favorite courses list. With that in mind, who were some teachers that particularly inspired me at Yale? One was a fine Texas gentleman whom I knew the rest of his life, named Charles Walker. He taught several of the chemical engineering courses. Remember, there are only five on the faculty. I never met the quite well-known person who was chair of the department of the time, because he was being president of the American Institute of Chemical Engineers the year I would have taken thermodynamics from him. Thermodynamics was instead another very impressive individual, named Harding Bliss, who was totally bound into a wheelchair. I think he had the use of the end portion of one arm, and that was all. He could talk, and he did talk. He would sit there, writing on a strip of celluloid, I guess I would call it, where you wound it to turn it and get a fresh surface to write on. All of this was projected onto a screen behind him. For that man to do what he did under those circumstances was immensely impressive to me. He was sort of a stern individual, but nonetheless I related well with him. He also became the first editor of the AIChE Journal when it was formed in something like 1955. There are a couple of professors with whom I related quite well.

If I tried to think of ones outside of chemical engineering, I'm not going to have one that I particularly related to there. There was another individual with whom I had much contact and felt very positively about. That was Grant Robley, who was the associate dean of engineering. He was sort of the student dean of engineering, but with various activities, like the Yale Scientific Magazine, I would deal with

him. I remember negotiating in my junior year with him on the assignment of space to the Yale Scientific Magazine. Where it would be. He wanted to take us out of Strathcona Hall, which was a building on campus, and move us up on Hillhouse Avenue to an old resident's building. We finally did that.

03-00:44:38

Redman:

What exactly was your role, actually, on the Yale Scientific Magazine?

03-00:44:44

King:

Managing editor in the senior year. The doing of it. There was a chairman, and then a managing editor. There was a vice chairman, who wrote columns having to do with the Yale Engineering Alumni Association, and then there were various business people. I was the managing editor to seek the content, get the content from here and there, put it together, glue it up, and deal with the printer, who was down in the other part of New Haven. In fact, I took a very entrepreneurial step during all of that. We had a printing plant that charged us a certain rate, and it was down more to the south in New Haven. I've forgotten how we did this, but I and one other fellow went on a search for a new printer who might be able to give us a better rate than this. We found one up on Elmwood Avenue, so I switched printers. And then even developed another entrepreneurial streak, again jointly with another student, whereby we got that printer to print us covers for laboratory reports in chemical engineering. Then I remember being called in by Charles Walker, whom I mentioned. "You know, you can't do this. You can't sell covers to your colleagues to put their reports in." And so that piece of entrepreneurial bit the dust. It was interesting.

03-00:46:28

Redman:

In our last session, you described some of the laboratory facilities at your high school. Could you actually make a comparison? I understand that there are a number of different labs that you would probably be a part of at Yale. Could you talk a little bit about the laboratory space there?

03-00:46:48

King:

The laboratory space in the whole operation for chemical engineering was really antique. It was the Sterling Chemistry Laboratory, right up on the top of Science Hill, built, I think, in 1898. Very, very old laboratory facilities. The building has now been thoroughly renovated and used by chemistry. Chemical engineering has moved, but in those days, it was in that building. A very old building. The laboratory facilities would be what you would expect in a very old building. Plus, what did chemical engineering laboratory facilities look like? It was really just open rooms with pieces of equipment in it. I do remember one that we had to do, which was crushing and grinding, where you

put on coveralls and gloves and whatever, and you take a bunch of rocks and you throw them in the jaw crusher and they get broken up into small rocks. Then you throw them into—I guess it was the ball mill—which was going to break them still further. Then, finally, something else puts them into powder. You can imagine what this room looked like with all of this going on in it. You immediately needed a shower upon coming out. It would probably not pass OSHA [Occupational Health and Safety Administration] at all today, given what you would inhale during this.

03-00:48:24

Redman:

I'm sure that you had to learn to use a lot of new equipment. I was wondering in particular if anything stood out as being either particularly challenging or particularly exciting.

03-00:48:34

King:

With regard to lab work again? Probably most interesting to me was something that showed up in a couple of ways. One was in organic chemistry lab, and the other was quantitative analysis lab. That was to be given an unknown. You don't know what it is. Now you have to do the chemical test that will determine what it is. We did this through quantitative analysis, and it was mixed metals and fairly standard procedures. Organic chemistry was interesting in several ways. First of all, that was a great big class, because Yale has a lot of premedical students, and organic is required for premed. It was a very large and mixed class. It was not at all just the chemical engineers. We were quite a minority within it. We all got given our unknowns. How do you analyze an organic unknown when it's given to you? Well, there's a sequence of things you do, including seeing what its boiling point is and looking up in a table of boiling points to see what things have that boiling point. Then you go on from there. I remember the person next to me opened his unknown, and within two seconds, it was obvious what it was. He had pyridine, which is the smelliest chemical there ever was. That was very simple. He just simply confirmed that it was pyridine. I had this thing that was colorless and seemed even to have a boiling range for the boiling point. It was odorless. I had to really go at it to figure out what this thing was. I do not remember what it was, by the way. Just the spirit and thrill of the chase in going through something like that was, to me, very attractive and very interesting.

03-00:50:48

Redman:

You said that now, the chemistry laboratories and the chemical engineering laboratories are separate in Yale, and that they weren't when you were there. So you shared the same laboratory space?

03-00:51:02

King:

We shared the same building. If the course was a chemistry course, and we did have to take a lot of chemistry courses, then you shared

their lab space and their classrooms. Those were all back and forth between chemical engineering and chemistry. For the advanced chemistry labs, they'd be different, and the chemical engineering labs with equipment in them, like the crushing and grinding, were of course different from the chemistry. But we shared the building very much.

03-00:51:32

Redman:

Did you work in professors' laboratories outside of your course requirements?

03-00:51:38

King:

I did no undergraduate research, as we would call it here at Berkeley. That is, I did not do something with a professor that was my own project or actual exploratory research. We didn't have that. The curriculum filled things enough without that. That waited until I got to MIT.

03-00:52:02

Redman:

Did you have a sense, when you were in college, of your personality in the lab? Would you be leading other students? Would you be working by yourself? Was that clear yet in college?

03-00:52:19

King:

That's an interesting question. Many things were just individual assignments. For example, on a qualitative or quantitative analysis lab, you're standing there at your own burette, doing your own titrations, and not interacting with others at all during the lab. My problem in those labs, by the way, was the fact that I'm left-handed. A burette for a titration is made for right-handed people, so that you put your hand around the burette to turn the valve or stop cock. For a left-hander to do it, you can't put your hand around it, and therefore you pull the thing out and everything that's in the burette comes out all over the table and your clothes. There was that problem, a solution to which was to turn the whole thing around and have the calibration markings on the burette in the back, where you couldn't see them, but then your hand would be in the right place. That's off the subject.

In chemical engineering, we did work in teams. Actually, the big lab course in chemical engineering was done the month of June. After graduation, you stayed around for June one summer to do this. That was a real bonding experience. The way it was done was simply to assign teams and to assign a leader of the team. Your role was given to you, rather than worked out by the dynamics among people. In that sense, I took the role I was assigned to, rather than finding a particular personality in that work.

03-00:54:09

Redman:

I can't help but think of my own experience in college. I was a physics major, but it was a small group. As probably happens frequently, other students would want to get together and talk about problem sets and that sort of thing. It was interesting to see how different students approached that. I liked to do the entire problem set and make sure it was perfect, and then go and meet with other students, but that wasn't the case for a lot of my peers. Did you have a situation like that where you did sort of have a choice?

03-00:54:42

King:

All homework of an individual assignment nature, we did as separate individuals. Particularly for the senior design course in chemical engineering, you did work in teams. We did that. As I recall, we chose our own teams for that course. It was people I knew and was comfortable with. I don't think we had a leader assigned to that one. This is not a lab course. This is design at a big table. On that, it was just how things worked out among individuals. No, I don't remember the extent to which I was a leader on that team.

#### Audio File 4

04-00:00:11

Redman:

You ended the last tape just mentioning something about a summer program. I'm curious about all of the summers that you spent during college. Let's just start with the first one. After your freshman year, what did you do that summer?

04-00:00:30

King:

Okay. What I did was to have a summer job at Fort Belvoir, which is just south of Alexandria. I didn't get the job, and so my father must have had something to do with the arrangements for it. I honestly don't remember how this one came about. I was sitting in a so-called technical assistants' group that did odd jobs as requested by the rest of Fort Belvoir. Fort Belvoir was the Army Engineer labs. The headquarters base. Those there were Army engineers, which meant dam-building and bridge-building and that sort of thing, by and large. That job was interesting, in seeing something about what engineering was about. It did not relate much to what I was doing professionally. It turned out that it didn't fill my time. The other two people in this group found it difficult to find something to give off to this freshman to do in the way of work. This, I found over the years, is very characteristic of summer jobs and internships. It depends greatly upon who in the corporation is making things work. If things are not made to work well, it can be a dull and poor experience for the individual. Many of these experiences are. I would say that one was not particularly useful or motivational to me in going forward on engineering.

After my second year, I believe I got the summer job myself by writing to corporations nearby that were chemical companies. I got a job at what was then Allied Chemical Laboratories in Morristown, New Jersey. I was coming home to Princeton for the summers because that's where my parents lived. My father retired from the Army after thirty years' service and was in Princeton. It was an hour's drive each way up to Morristown and back. I had my own car, which was the first car I had ever had. That was fun.

04-00:03:11

Rubens:

What was it?

04-00:03:12

King:

It was a 1952 Chevrolet. Green. That summer job was better. That put me into pilot work on making polyethylene. That's real chemical manufacturing. I understood the research. I made some friends. There was a senior technician there, whom I remember going off to a ball game in New York City with. In fact, I may even remember what ball game. I think it's July 30, 1954—I'm off. That was the next summer. The game was one at the Polo Grounds, where Joe Adcock hit four homeruns for the Boston Braves—which had been my team, by the way, because my formative years in baseball were the years in Massachusetts. Everybody remembers that the Braves from Boston went to the World Series in 1948. They did not win, but it was their first National League championship since 1914.

Now, back to Allied Signal. That was after my second year.

04-00:04:25

Rubens:

Allied Signal or Chemical?

04-00:04:28

King:

It's called Allied Signal later. It was Allied Chemical at the time. Like all these chemical companies, they merged and remerged over the years. The next one, my junior year, was Union Carbide Corporation, Bakelite division. Bound Brook, New Jersey. That's half the drive that Morristown was.

That was a short summer. About half the way through it, I developed mononucleosis. That put me on my back for something like five weeks, as I recall. People were very careful about that disease then. That's when I got to read Gone with the Wind and books like that. That was a short job. That didn't go as long as it could have. That, too, was pilot plant work, and actually a very good job. Then, after my senior year, if you want that one, I went to work in New York City for M.W. Kellogg Company, which is now known as Pullman Kellogg. They had a building up around maybe Forty-Seventh Street and—Park Avenue? Third Avenue? Second Avenue? Not sure. But anyhow, that



part of New York. I lived with a friend who had been a fellow chemical engineering major at Yale in a six-floor walk-up on East Thirty-First Street, between First and Second Avenues, in the heat of a New York summer. Right near Bellevue, this was. We would go up to Pullman Kellogg, or M.W. Kellogg, as it was in those days, every day. That was calculation work. One thing I remember greatly about that summer was being given the assignment of calculating a distillation of—it was probably associated with ethylene manufacturers, so methane, ethane, ethylene, propane, propylene, and doing this by hand. That's totally different from what it is nowadays. Nowadays, you would fill out an entry form for a computer program, press go, and in ten seconds, all the calculations of all the compositions along the column would come back to you. Not so in those days. This was a trial and error calculation, with the only help being a mechanical calculator. One of these old Monroe things, where you pressed the buttons and then press something to make it do the calculation. You clank, whirl, bang, bang, and out comes the result of the calculation. But all of this by trial and error, which meant many calculations per stage, and many stages per column, such that the calculation of the entire distillation column was probably something like a four-day effort. Four full days. That's what I was doing that summer, was largely calculating distillation columns.

04-00:08:07

Redman:

Could you walk me through that process from the beginning? I'm unfamiliar with it. So you would be given a chemical?

04-00:08:18

King:

I would be given a mixture that was coming to this tower. I would be given desired products to be made. One of two things. I'd either be given desired products to be made, the overhead and the bottoms from the distillation, or I would be given the number of equilibrium stages within this column. If I had the number of equilibrium stages, then I'm going to calculate what the outputs will be, top and bottom. If I've been given the outputs top and bottom as what I must meet, then I'm going to calculate the number of stages I need in order to meet this. I think it was the last, latter, was the type of calculation I was doing. So each stage is an iterative calculation as you go through this. With all of these having to be every step and by hand, it took a long time.

04-00:09:12

Redman:

You were given the data. So you really were just doing the calculations.

04-00:09:16

King:

I was a calculator.

04-00:09:18

Rubens: What kind of company?

04-00:09:20

King: It's a design and construction company, of the nature of Bechtel or Fluor. It builds chemical plants, refineries, and such. Huge company. Worldwide.

04-00:09:34

Redman: You had mentioned, for your first two jobs, the summer jobs, that you didn't get the first one yourself, and then you got the second one. I assume, then, that's the case for the third and fourth? Did you also pursue those?

04-00:09:50

King: Yes, I found all of those jobs. By and large, I did it by writing to corporations. I always decided I wanted to work at a different place each summer, so I never tried to go back to the same place. In the case of Pullman Kellogg, the recruiter had actually come to Yale, interviewing for possible summer employees. That's how I got that one, in a structured, organized fashion. Both Allied Chemical and the one in Bound Brook with Bakelite were a matter of having written to them and others to see what would materialize.

04-00:10:33

Redman: Was there a point in college that you knew that you would distinctly prefer a career in academia rather than one in industry? I ask this right after I talk about your summer internships. There must have been a time when you started thinking about that.

04-00:10:56

King: I don't think that issue had been decided or even really addressed by me during my undergraduate career. That decision comes with graduate school. I did the next logical thing after the first thing. Graduate school was logical after undergraduate. I liked it. Okay, if I like that, what's the next logical thing? Well, be a faculty member. That kind of logic—

04-00:11:36

Rubens: There was not a thought of working in industry before going to graduate—

04-00:11:39

King: I did work in industry with the summer jobs. When we get to the Practice School, which is at the end of my MIT graduate school education, it has that element.

04-00:11:56

Redman: Would you say that you had any lasting mentors in any of these summer internships?

04-00:12:04

King: From the summer internships? No. I don't believe so. I didn't keep contact with anybody after I left the job.

04-00:12:15

Redman: Were you generally the only college student there?

04-00:12:20

King: That was true for the portion of the company that I was in with Allied Chemical and Bakelite. There were probably other college students somewhere else, but I wouldn't know who they were or what they were. That's not true with Pullman Kellogg, because they had expressly recruited for summer students, and they actually, I think, gave us some organized meetings to tell about the company and the industry.

04-00:12:56

Redman: Did you have any other jobs while you were in college?

04-00:13:05

King: No, no job as I went along. In fact, that would be a rarity for a student at Yale in those days. I'll take that back. It wasn't that much of a rarity. Yale had what were called bursary jobs. These are jobs within Yale that students are given as part of their financial aid package. Since I had the Greenway scholarship, I didn't need that.

04-00:13:33

Redman: In a moment, I'll talk about your transition from college to graduate school, but before that, you had mentioned that your love of the outdoors was already very well-developed by the time you got to college. Were you able to hike, to be outdoors, when you were in college?

04-00:13:52

King: Yale didn't present many possibilities for that. We would go to East Rock, I guess it is, up above New Haven, a few times. Yes, I remember once walking up it and down it as a sort of special event for a weekend day. Other than that, it presented relatively few opportunities. I really took a hiatus from that sort of thing, just because of circumstance, between my last summer camp year as counselor and coming to California.

04-00:14:28

Redman: Did you have a car when you were in college?

04-00:14:32

King: Not with me.

04-00:14:34

Redman: So you didn't do very many weekend trips, then?

04-00:14:37

King: No.

04-00:14:53

Redman: If you weren't hiking, what were you doing on the weekends?  
Obviously, some work, but—

04-00:15:01

King: You stayed around Yale. In basketball and hockey season, I think I probably, with groups, went to every home game. And many did. That, and then there was bridge. I learned to play bridge at Yale. That would be a Saturday night event in somebody's room, often our room, playing bridge. That's an interesting aspect of my life, because I played a huge amount of bridge at Yale and actually earned a master point by going to a tournament that was in Bridgeport or somewhere like that and doing remarkably well. Then cold turkey, because Jeanne has never played bridge. So it atrophied as of about 1957.

04-00:16:06

Rubens: Are you practicing your beer-chugging then, during the bridge games?

04-00:16:12

Redman: You have to practice sometime.

04-00:16:15

King: Well, I can do real well with a glass of water.

04-00:16:19

Rubens: How about smoking and drinking?

04-00:16:24

King: My smoking career is interesting. That, of course, was an era when people smoked. I decided I had to be real distinctive and very Yale-like, and I smoked a pipe. I did so not with any large frequency, but often enough at Yale and on into graduate school at MIT. I would have stopped this either late MIT or early Berkeley. The reason was the surgeon general and all that. This was not a nice hobby to have. So, so much for that.

04-00:17:08

Rubens: This is just a little bit of a sidetrack about Yale. You sought out working for business for your summer internships, except for the first year. What was the nature of corporate sponsorship in the chemical engineering department? Were you aware of professors consulting with corporations?

04-00:17:32

King: I knew that some had done some consulting work. However, the Yale faculty were not as large on that as the MIT ones would be when I got there. It was not part of the scene, insofar as what I experienced and

dealt with there. In hindsight, I know that some of the Yale faculty did some consulting, but not a lot. Then these issues of corporate involvement in the university, such as you might think in terms of BP [British Petroleum] or Novartis here at Berkeley, that hadn't happened then. We'll get to 1980. The Council for Chemical Research was really a substantial beginning of that in chemistry and chemical engineering.

04-00:18:29

Rubens:

By the way, I asked this question about going to EHS, regarding your encounters with "the elite." Yale was, of course, known for having extraordinary students, as well as children of political-dynasty families. They might not have been that good, but I just wondered if you had a sense that you were amongst the best and the brightest.

04-00:18:58

King:

It was certainly an impressive environment. One that I knew somewhat during my freshman and sophomore years was Varick Tunney. I believe he came by a different name later. This is the one who became senator from California eventually.

04-00:19:35

Rubens:

John Tunney.

04-00:19:16

King:

Gene Tunney's son. Well, he was Varick at Yale. It's John V. Tunney. I had him. Jim Jeffords was a member of my class. A longtime senator from Vermont.

04-00:19:35

Rubens:

You had mentioned Calvin Trillin.

04-00:19:37

King:

He was one year later.

04-00:19:39

Rubens:

Did you know him particularly?

04-00:19:40

King:

I did not know him, but I knew a number of people from that class after me.

04-00:19:47

Rubens:

The other one was David McCullough. He would become the Pulitzer Prize-winning historian. I don't know if he distinguished himself then.

04-00:19:55

King:

No. Another member of my class was Fred Crews. In fact, he lived one story down in Timothy Dwight. The Berkeley English professor. If we want, I can paw around and find some others. They were there. And

they were there in two ways: ones who would become something big and ones whose heritage was something big, like Tunney.

04-00:20:26

Rubens:

For another reason, I was looking at the history of the financial firm Morgan Stanley. One of the founders comes out of Yale.

04-00:20:31

King:

Yes, a lot of them do.

Richard Thornburg is another one who was there at that time. Class of '55. He was governor of Pennsylvania, and then maybe some things with Bush I.

04-00:20:54

Redman:

Well, to get back to my weekend question, you've mentioned a number of things. You've mentioned that, generally, students stayed around campus on the weekends. You've mentioned that there wasn't much interaction with the outside community in New Haven. You've mentioned that you went to an all-male school. You're coming up on a marriage soon. I'm wondering, first of all, just in general—

04-00:21:29

King:

Well, the social life aspects—there would be prom or dance weekends, or football weekends, where there would be a group come down from Mount Holyoke or Vassar or some place like that. I've forgotten completely how the process worked, but I sometimes ended up with dates there. I would date various girls during the summer. Princeton and then Washington before that. There was some, but not a lot. It was an inwardly-looking male school environment.

04-00:22:16

Redman:

Interesting. So how did you meet Jeanne? Was it in one of—

04-00:22:19

King:

Yes. Well, the Yale Scientific Magazine was a member of the Eastern Colleges Science Conference, which met annually. All colleges with science magazines, and maybe it was science organizations, were invited to send delegates to this. This particular year, which would have been the spring of my junior year, the science conference was at Seton Hall in South Orange, New Jersey. I and a lifelong friend of mine, Joe Barrie went. We were probably the two from the Yale Scientific Magazine. He was the vice chairman who wrote the columns for the alumni. Here were these two women. One, Joe knew already, because his roommate had dated her, and his roommate ended up marrying her. That woman was one of the two. There they are, as delegates from Albertus Magnus College, of New Haven. Just up Prospect Street, beyond Science Hill.

04-00:23:50

Rubens:

A women's college?

04-00:23:52

King:

All-women's college. Catholic women's college. Dominican. So we palled around with these two. I certainly liked who I had found there, and so it was not a difficult thing to keep up with her during my senior year. I took the long bus ride out to Guilford, Connecticut, where she lived at the time. It was about an hour-long bus ride, because it stopped many places and took a circuitous route and would come back. So I'd visit her out there, and she'd come and visit me. We spent a lot of time together my senior year, and that's how that started and blossomed.

04-00:24:45

Redman:

You said that you met her in the spring of your junior year. Where was she that summer?

04-00:24:49

King:

She was one year behind me. She was class of '57 from Albertus Magnus, so she would have been at the end of her sophomore year there. Towards the end.

04-00:25:00

Redman:

Did she go back up to Guilford for that summer while you were in New Jersey?

04-00:25:05

King:

Yes. In fact, she was a chemistry major at Albertus. She would never admit to that now. Chemistry is long gone. She was a chemistry major at Albertus and she had a summer job at the Yale medical school, with a person who was also a graduate student in the chemistry department at Yale. The advisor of this person was a man named Harry Wasserman, who blossomed at Yale. A very outstanding faculty member as the years went on. That's where Jeanne had a summer and during-the-year job.

04-00:25:59

Redman:

Did you get to see much of her that first summer?

04-00:26:04

King:

Not the first summer, no. We got back in gear in New Haven.

04-00:26:08

Redman:

Can you tell me a bit about her background, her childhood?

04-00:26:12

King:

Yes. She was born in Waterville, Maine, of a family that was largely French-Canadian. French was not the language at home, but it was readily spoken at home. A very ordinary family. Her father had been, I

think, a delivery driver for a bread company or something like that, but was killed in a car accident early on, way before I met her. Her mother remarried. The new family moved to New Haven. She went to school in downtown New Haven, then to a private Catholic girls' school, again in New Haven, as high school, and then Albertus. Her new father had had employment in the automobile sales business out in Branford and Guilford and Madison, which are the towns as you go east along Long Island Sound from New Haven. A very large family. This is interesting. Me, an only child. My father, an only child. Jeanne had four other siblings, all from the new father rather than the old father. She's the oldest. Many aunts and uncles, so it's a huge family back there.

If you ask me how she got interested in science, I've never really had that one talked through with her. I think she just found it to be a very interesting and compelling and attracting subject. I don't think she ever had thoughts of a career. Of course, this was when women didn't have careers that much. She did some future work in chemistry. When we get to Oak Ridge, which we will, in 1959, she worked irradiating plant seeds for the University of Tennessee, in a large field that was full of the horses and donkeys that had been there in New Mexico when the first tests went off. So hot donkeys. Actually, during my graduate school career at MIT, she worked at Dewey and Almy Chemical Company, the Cryovac division, studying plastic films that wrapped frozen turkeys. She had a little chemistry career. She's a very logical, organized, get it done type of person. That probably was one large attraction to me, plus just our utter compatibility. As we go on from here, it is a team effort, and she's an awful important part of the team.

04-00:29:51

Redman:

You mentioned that she, for a bit, went to a Catholic girls' school. Did she come from a Catholic family?

04-00:29:57

King:

Yes.

04-00:29:58

Redman:

Was that ever an issue for either of your families?

04-00:30:01

King:

Oh, yes, sure. My mother was particularly bothered by this. Here again, I think we have an example of me making my own choice, despite the guidance that I was given. I think, since my life had been so structured, and in some ways, determined, by my mother as I grew up, these events where I did my own thing were traumatic for her, if not for me. Yeah, the religion issue did come up there. My mother was bothered by it. I figured, well, we're just going to do it. This is who I



want. For her family, it was a different and odd thing, but perhaps not as much of an issue.

04-00:30:51

Redman: Did your mother come around eventually?

04-00:30:54

King: Oh, yes.

04-00:30:58

Redman: Did you spend much time with Jeanne's family, and vice-versa? Did she spend much time with your family?

04-00:31:03

King: I more with hers, because that senior year at Yale, I was going out there all these weekends to Guilford. My family had probably spent a total of five days, four days, in her vicinity, or interacting with her, before we were married.

04-00:31:28

Redman: I wanted to actually give you the choice. I'm at the point where I would like to talk about your transition to MIT. If you would like to save that for the next time, we have—

04-00:31:37

King: No, I'm glad to do it.

04-00:31:38

Redman: Okay. As you reach the end of college, you had said that the next logical step was just simply to go to graduate school. So this was what you definitely wanted to do. You didn't really give any alternatives much other thought. Is that correct?

04-00:31:55

King: That is correct, yes. I think I probably interviewed with General Electric Company and maybe one or two others while at Yale, but with no intention of doing it. It's possible that that waited until my MIT career. Now that I think about it, I believe I didn't interview with anything other than M.W. Kellogg for the summer job.

04-00:32:27

Redman: So how did you make the choice of MIT?

04-00:32:29

King: Okay. What are the good graduate schools for chemical engineering in those days? That was the first and most important question. The answer is sort of interesting. MIT was where the textbooks had been written. That is the answer to what eventually drew me to MIT. My gosh, all these impressive textbooks have been written by these people. Shouldn't I go to Mecca? That was one factor. What were other

leading chemical engineering schools I should think about? Here is Princeton again. I did look very seriously at Princeton. The chair of the department there, long-term chair and head, was a man named Richard Wilhelm, who my parents knew socially in Princeton. He took a strong interest.

Then, having been advised that it was another place I really must look at, I looked at the University of Delaware, which is an interesting story within chemical engineering. Delaware was and still is one of the premiere departments of chemical engineering, by research basis or any other measure. The reason really was Du Pont [Corporation]. Du Pont had put a lot of money and effort into Delaware and built a very good faculty. I went down to Delaware and was treated royally, much more so than the other two. That made a very singular impression on me. This was family, this place. You would really interact a lot. It would be good. That's what was going for Delaware. Proximity to Princeton was going for Princeton, and probably was a negative factor on Princeton once again. MIT was Mecca because of all these textbooks.

I picked Mecca. It helped that I applied for and got a General Electric fellowship, which I carried all the way through MIT. The General Electric fellowship put me in the position where the financial aid from the institution was not important. I had it all from the General Electric Fellowship. The General Electric fellowships, they don't exist anymore, but in those days, they were a real plum, comparable to what an NSF fellowship is today, but even more so, because I think they paid more. I had three different General Electric fellowships, or maybe four, as I went through MIT. They were named for various different presidents of GE. One of them was a Charles Coffin fellowship. I remember that. General Electric was making a real effort there to try to interest very good, upcoming people in the company, and thereby give a boost to their recruitment. It almost worked.

04-00:36:09

Redman:

One of my future questions that I have written down is whether or not you had to seek out external funding, but it sounds like it was just—

04-00:36:18

King:

No, I did not. That's a very important part of it when I got to MIT. I was actually the last, or very nearly the last, of the generation that would pick his own topic, define the topic, convince a professor that the professor would advise me on the topic, and that's what I did. That doesn't happen anymore.

04-00:36:48

Redman:

Did other students that you were in graduate school with need to seek out external funding, or did most students have some sort of—

04-00:36:58

King:

It's a mixture of TAs [teaching assistantships] and fellowships of one kind or another, and some NSFs. There were professors who had support for their research work, although in those days, we're just coming into that. The NSF, I think, is founded in 1950, if we look at its history.

04-00:37:19

Redman:

Yes. They don't start doling out money, I think, until '51.

04-00:37:22

King:

Yes, so this is early on.

04-00:37:24

Redman:

They weren't well-funded until Sputnik, really.

04-00:37:28

King:

My guess is that maybe a third of the faculty at MIT had this external funding. Others picked up fellowship students. It's really a point of transition in that world, because today it's all grant support.

04-00:37:53

Redman:

I'm just curious personally. Did you at all feel like you missed out on an experience of learning how to get grants, or was that not an issue at that time?

04-00:38:07

King:

Oh, that was an issue. I didn't recognize it at the time, but yes, you don't just sit down cold and start writing grant proposals. Yet, that's what I had to do when I came here. I wasn't very good at it. I was just starting from scratch. My first proposal was in a field where I didn't have enough expertise and where the NSF sent it off to be reviewed by the real heavyweights of the field. They said what a critical referee would say about such a proposal. We'll get to that. The way I started to do creative research is an interesting story in itself.

04-00:38:50

Redman:

Would you say that the flexibility that you were awarded by having this GE fellowship was more beneficial than having gotten grant writing experience? If you can really rank those, I guess.

04-00:39:05

King:

Well, I've certainly supervised a lot of students in the latter mode. I did a perfectly good doctor's dissertation, and as it turned out, defined a perfectly good problem. I didn't really have the general abilities to do that sort of thing well. It was a lucky strike on finding that topic. I probably would have done better by having something predefined given to me at that point in my career to figure and work out.

04-00:39:51

Redman:

Did you choose a research advisor before you went to MIT?

04-00:39:56

King:

I did not. Let me, incidentally, just for the record, insert something. I did say back there that Oak Ridge was 1959. It's 1957. It's where I went as a Practice School student, not as a Practice School director. Leave that aside for the moment. No. Here's what happened. I was in a situation where I should shop for a research director. The expectation was that when you're in that situation, you should do some predefinition before you go to the research director. Well, I had decided as I got to that stage, which is coming back from the Practice School, and therefore January 1958—we can do these out of order, because this is an interesting story.

The person I really wanted to work with wasn't there. It was Thomas K. Sherwood, who had written two of the very impressive textbooks that had boggled my eyes so. He was on a sabbatical leave at Berkeley, California—the University of California. He wasn't there, so I couldn't present a topic to him, and yet I had to. I had to get something going at that point. Okay, who else has worked in this area and has a record? I went into Ed Vivian, a wonderful man, who I think had only five or six doctorate students ever. He had worked on the subject that I had chosen to get into and define a problem in. I went to Ed Vivian. I said, this is what I think could be a good project, and why.

What that project was was one involving the rate of mass transfer or absorption in what's called a packed tower. You take Raschig rings, or Berl saddles, or pieces of old junk, and you throw them into a large tower. Liquid is made to run down over all of this surface, and it's exposed to a gas that's coming up the other way. You've got a countercurrent absorber, which absorbs something out of the gas into the liquid. That was the process I wanted to work on. The literature, which I had read, starting by reading papers that Sherwood had written, showed me that a particular study by Sherwood and [Frederic A. L.] Holloway, back about 1939, had come up with experimental results that showed for mass transfer diffusion in the liquid phase, in one of these absorbers, that the rate of absorption depended on the diffusion coefficient of what you were trying to absorb to the two-thirds power. There was a theory that had been developed in 1950 called the Penetration Theory, which applied to liquids flowing down with no shear on the surface, the only shear being the surface they're flowing over. Diffusion into that for a limited period of time should give you a rate that depends on the diffusion coefficient to the one-half power.

Here was an unresolved discrepancy. Would this not be a good area of research? Vivian said it would indeed be a good area of research, and yes, I can help you, I'd be willing to advise you, and by the way, I have this friend, Jim Baird down at Artisan Metal Company in Waltham, Massachusetts, who will fabricate a packed tower for you that you can use for this study. Baird did this. I have no idea where the money for the pipes and the soldering and whatnot that went around this tower came from. There was a shop there, and I worked a lot with the person in the shop, but who pays never became a question. That was the nature of my doctor's research, was this rather substantial packed tower out in the bay of Building 12 of MIT. Absorbing various gases, various dilute gases, out of air, into water. Shall I keep going on this before we go back? Yes?

04-00:45:23

Redman:

Sure, yeah. Actually, if I could just break in right now, you said just now that you're looking at absorbing gases out of the air, into water. Were you just looking at air and water?

04-00:45:36

King:

Yes, but the solute gas would be carbon dioxide, oxygen—which, of course, is a big one there—hydrogen, helium, and there was one other—argon. Picked to have a range of diffusivities. If I'm going to do this and make these measurements, it's probably a good idea to measure the diffusion coefficients over again. That's done by a method called a glass diaphragm cell. It was very well-established at the time. You take a piece of fritted or porous glass, and you build glass compartments on either side of it. You put a solution rich in the solute on this side, and a solution with no solute, or depleted in the solute, on the other side. You let it go for three days, or a week. Liquid diffusion coefficients are small. Then you come back and you analyze.

For my analysis, I got steered by Vivian to a brand-new analytical technique at the time called gas chromatography, which, of course, became huge subsequently as an analytical technique. I took an early gas chromatograph, and I had a device that would de-sorb all volatile solutes out of the water sample, into a vacuum, and collect what was there. Then I captured a volume of what had been stripped out of the water into the vacuum, and shot it into the gas chromatography, and then would see the peak size for the solute in question.

04-00:47:18

Redman:

This was a new—

04-00:47:22

King:

The use of the gas chromatograph for this was brand-new.

04-00:47:28

Redman:

I've been sitting here wondering why that hasn't been used.

04-00:47:32

King:

Gas chromatographs were brand-new. The Nobel Prize for [Archer John Porter] Martin and [Richard Laurence Millington] Synge on the subject of chromatography is 1950. The market took a little while to make gas chromatographs. I measured the diffusion coefficients. I found the literature diffusion coefficient for hydrogen was wrong, and that for helium, the other very high-diffusivity gas, had never been measured before. When I took my diffusivities and applied Sherwood and Holloway's data to them, by god, it was the half-power, like the theory said it should be. At that point, Sherwood was back from his sabbatical at Berkeley. I have to give my doctoral seminar. I had to give one of those every year at MIT. I give it, reporting on the diffusivity measurement. Sherwood asked me some questions in the period afterwards. Then he volunteers the statement, "Give this guy his degree. He's done his research." But no, Vivian thought I should measure these mass transfer coefficients in this packed column, and so I spent another year doing that, and got essentially the same data as Holloway's data, and therefore the same answer, that it was the half power. That was the nature of my doctoral research. The interesting thing to me about that is my having had to do that in a mode of cook-it-all-up myself, with regard to what the project would be. Which is a lot to ask a doctorate student to do—a very inexperienced person.

04-00:49:25

Redman:

I guess the best way to ask this is, did you have a hypothesis of what would happen, or were you just investigating the problem?

04-00:49:32

King:

I had two hypotheses. I was either going to find, somehow, that the Penetration Theory did explain it, or I was going to have to come up with a new theoretical basis to interpret whatever these data ended up saying.

04-00:49:50

Redman:

Did you have any thought that the problem would be in the incorrect measurement of the diffusion coefficient? You clearly did that experiment, but—

04-00:49:59

King:

I didn't expect the answer to lie in the measurement of the diffusion coefficients. It just did.

04-00:50:07

Redman:

So in that sense, I would think—it sort of depends on the chronology of how you attack this problem—it seems like you then probably

finished your research much more quickly than you probably anticipated. Is that the case?

04-00:50:27

King:

I entered MIT fall of '56, and my doctor's degree is June of 1960. It's somewhat delayed, because in September of '59, I begin directing a Practice School station, so I've got a job during that last year, when I'm still writing the thesis. The experimental work was all done before. So I probably could have done it in three and a half, if I had not had the Practice School to tend to. So that's fairly fast.

04-00:51:02

Rubens:

Are you an assistant professor of chemical engineering when you're the director of—

04-00:51:08

King:

Yes. The way they do these Practice Schools, they give the assistant professor title, but it's not a ladder appointment, as we would call it. It's a contract appointment for three years. The idea is you direct the Practice School for two years, and the third year is for you to find what's going to be your employment. Meanwhile, you can teach at MIT for that third year.

04-00:52:04

Redman:

I'm curious, when you first entered graduate school, did you have coursework that you needed to do?

04-00:52:11

King:

Yes, I did a year of coursework with those people. I remember W.H. McAdams, who had written the heat transfer text, one of the magnets, he must have been eighty years old at the time, sitting—sitting, not standing—at the front of the room, reading his book to us as the course. I took the courses, enjoyed the courses, did well. I did, as I think I mentioned back in the first session, take a nuclear engineering course there, which was part of deciding whether I should go the nuclear direction. Nuclear engineering at MIT had grown out of chemical engineering, being started mostly by a man named Manson Benedict, some of whose work I used later on. Also, I think at the time, there was one Thomas H. Pigford there, who later came here. I took a quite thorough nuclear engineering course as part of those courses. That was five courses, both semesters. And lots of trips from Massachusetts down to Guilford, Connecticut during that year.

04-00:53:40

Redman:

And you had choice of courses that you took, to some extent, or no?

04-00:53:45

King:

Not really. Yes, to some extent. But you had an advisor. One man was the graduate advisor to the whole department of graduate students. His

name was Glenn Williams. It was pretty well laid-out what you should take. You might have a choice with regard to one or possibly two of the courses, but the rest were de rigueur.

04-00:54:13

Redman: How big was the graduate program?

04-00:54:18

King: Fairly large. I will guess that entering with me were maybe twenty to twenty-five others. Then, of course, people stay there, so the total population in-house was probably over a hundred.

04-00:54:46

Redman: Was there a sense of community or did people generally work independently?

04-00:54:53

King: Less so than at Yale. The experience was very different from undergraduate life, and particularly with me now having something else to do with most of my weekends. Yeah, there were some ways that people got together and did things. There was something called the Ten Club for Course Ten. MIT has the distinction of not having biology, chemistry, chemical engineering, et cetera. They have course one, course two, course three, course four, et cetera. Course Ten is chemical engineering. There was a club of sorts that was elected membership, and where you went out and got speakers. I remember going out and getting Louis Lyons, who was the creator of the Nieman Fellowships at Harvard, and who had a program on the public broadcasting channel in Boston, WGBH. He had this analysis of the news that was on every week. When it came my time to get a speaker, I went to him, and to my amazement, I got him. He came and met with the Ten Club. Interesting. A journalist with a bunch of chemical engineers.

04-00:56:14

Redman: So it was an interdisciplinary program—

04-00:56:17

King: No, it wasn't. I think this is the early hallmarks of something I've become more and more. No, nearly everyone else was gotten out of chemical engineering in the Boston area. I actually made two efforts. I've forgotten whether it was two efforts for one meeting or whether it was two different meetings. The other person I remember trying was General [James A.] Gavin, who was the CEO, I think, of Arthur D. Little at the time. Arthur D. Little is another consulting company. There was a lot of chemical engineering in it. Grew up in parallel with MIT. Arthur D. Little himself had much to do with early chemical engineering at MIT. General Gavin wasn't able to do it. I either then went to Louis Lyons or went for the next meeting that I had organized



to Louis Lyons and got him. But no, it was not at all common to go outside of chemical engineering. I thought it would be interesting to do so. And I did.

04-00:57:40

Rubens:

I just wanted to know, why was your father at Princeton?

04-00:57:45

King:

Once he retired from the army, he considered several sources of employment. I remember he was in contact with Eric Walker, who was the president of Penn State [Pennsylvania State University] at the time. There was some possibility of going to a teaching post at Penn State. He looked at some other things. Signal Corps career at RCA (Radio Corporation of America) Laboratories. RCA Laboratories was outside of Princeton, at Princeton. It was down at Princeton Junction. He hooked on there in an administrative role, and that was a little complicated because he, for a year, could not deal with the government, and yet the position he was taking would be dealing with the government on contracts and such things. So he became their college recruiter for a year and did some other things to pass that year, then got into the contract and administration business, and then retired from them after maybe about five or six years after going with RCA. He was retired at that point, except he was sort of the chief administrator and business officer of the Princeton YMCA for a while. This was like a third-time employment.

#### Audio File 5

05-00:00:03

Redman:

This is Emily Redman and Lisa Rubens talking with Jud King. It is Thursday, May 5, 2011, and this is tape three. You were just getting ready to tell us an important story about your father.

05-00:00:15

King:

Yes, my father's last appointment is kind of interesting. He was the original curator of the David Sarnoff Museum at the RCA Labs. This was as Sarnoff was coming to the end of his life. Things were being collected. Everybody in RCA wanted to do this marvelous library. Think, now, of Kennedy Library, that kind of thing, that would have all of his memorabilia and writings and so forth in it. He went through several years of that—actually two or three years—of getting all of Sarnoff's material from his dwellings in Manhattan and bringing them down to Princeton. The layout of the library/museum, which it really was, and the organization of its contents and so forth. He actually had quite a bit of interaction with David Sarnoff right at the end, too. Interesting man.

05-00:01:26

Redman: So you entered graduate school in 1956, and the first year was a year of coursework.

05-00:01:33

King: Right, '56, '57.

05-00:01:35

Redman: And then you continued on in MIT for another year after that?

05-00:01:41

King: The next thing that happened is that I got married that year.

05-00:01:48

Redman: That was that summer?

05-00:01:51

King: We were married on June 22 [1957]. After our honeymoon, we went immediately, driving, to Oak Ridge, where I was going to be, the following fall, a student at MIT's School of Chemical Engineering Practice there. Before that started, I had a summer job at Oak Ridge National Laboratory. It was supervised by a University of Tennessee professor, named Stanley Jury. It was a test of what was then called the homogenous reactor system, which was a self-contained nuclear reactor idea, where the problem was that all the contents in this flowing solution within the reactor were exceedingly corrosive. The idea was to put water under pressure in through the walls of a porous pipe. The pipe we used was the same nickel that is used in the gaseous diffusion plant at Oak Ridge for the enrichment of uranium by passing it through sintered metal. The idea was to force water in through the walls and keep this corrosive stuff away from the walls and keep it from eating up the pipe. My whole summer job was on that. It was quite interesting, except I could never succeed in not having the pipe eaten up. That's because I learned about entry regions. Even if you're going to force all this water in through the walls, still, right at the entrance to the pipe, there's going to be an infinite mass transfer coefficient and a huge amount of corrosion, and there was. The pipe kept getting eaten up right at the entry point. That was the result of my summer job—finding that out.

05-00:03:41

Rubens: Did you say "entry region"?

05-00:03:45

King: Yes. The boundary layer, it's called in the business. You develop a boundary layer once a flow enters something new. A boundary layer near the wall. That boundary layer will be where, in this case, the water would have kept the corrosive solutes away from the wall, except it doesn't keep them away from the wall at the very beginning of the pipe.

05-00:04:13

Redman:

How much choice did you have of research when you were there?

05-00:04:17

King:

None. That was an assigned project.

05-00:04:20

Redman:

Did you know what you would be doing before you got there?

05-00:04:23

King:

No, I didn't. I was in the position of having a new wife. We wanted to get settled. We knew we were going to end up in Oak Ridge from September through January and Oak Ridge would be interesting. Why not go there early and find out about it? We did. That's when Jeanne had the job with the University of Tennessee, irradiating the seeds, with the hot burros around her. We arrived there. There's an interesting story on that. It was right as Oak Ridge was starting to go into private ownership. It had all been governmental ownership before then. Assigned quarters. So it was just going into private ownership. That was interesting, because business and commerce was just starting to come in—shopping center and all that.

We got there, and so we were to get government dwellings associated with this summer job. That would be the N1 apartments. We were given our choice of two of the N1 apartments. Both had problems. One had a three-foot-by-three-foot section of the floor missing. It was covered by a rug, but you should be careful not to step there. The other had a different problem, which was that the windows had not been built with a square. What should have been ninety degree angles were eighty-nine and eighty-seven and ninety-five degree angles. Therefore, the windows didn't close. We had government-issued furniture. If the wind blew, the windows opened, and it blew through the apartment. I think we went through four floor lamps, government-issued, the first three having been blown over in this apartment. The rent was \$55 a month. Then we really upgraded when it became time for the Practice School to begin. The Practice School had its own accommodations, which was the Red Brick apartments, right over near the downtown shopping center of Oak Ridge. We moved over there and lived there, where the other Practice School students were, for the semester.

The Practice School consisted of a director, who had the interesting name of Tom Mix, being there, and the associate director who later became dean of engineering at the University of Washington, Ray Bowen, and then all these students. The director and the associate director found current problems, situations, on one thing or another within the Oak Ridge National Laboratory for the students to work on in teams. Different compositions from time to time. Different leaders at different times and so forth. That's what we did for that semester. It

was a bunch of about four problems that had been created. I guess all but one were in X10. These locations at Oak Ridge are known by map coordinates.

One was at Y12, which was actually a secure area. It was a dump tank to keep thorium agitated while it was in a slurry. It was a day-round, weeklong operation to do this test, so we worked in shifts that rotated from day to day so we didn't always have one person on night shift. Took all of these samples. That one worked well, except for the fact that it was decided that the thorium was radioactive enough so that we should get tests for radioactivity. We had our first exposure to a whole body balance on radioactivity. We were okay. Not contaminated. That again relates to the early days of the nuclear and radioactive business, when people weren't so careful. That one will return with Gilman Hall in my dean days.

05-00:09:08

Redman:

You said that Jeanne was excited to go to Oak Ridge.

05-00:90:11

King:

Yes. She had never been outside of Maine and Connecticut. This was an adventure. Also, there was something else interesting about Oak Ridge, relating to another theme that I see we're developing here. This was about six months after a man named John Kasper had been in a violent action at Clinton High School in Tennessee having to do with integration. This was early on in the integration business. Clinton had had the headlines. Well, Clinton is just maybe ten miles north of Oak Ridge. We would actually go up to Clinton. That was where you went out to dinner. If you wanted a real fine dinner, you went to the Park Hotel in Clinton. You had all these fine Southern dishes served at the table. That's where I discovered fried okra, which is wonderful. Unfried okra is not wonderful. Fried okra is good. It was an immersion into the turbulent South of that era. Of course, the government town of Oak Ridge was an island amongst eastern Tennessee. Eastern Tennessee is not the most fundamental South. In fact, it almost didn't go with the South in the Civil War. It very nearly stayed with the Union. It's not like the rest of the South, but nonetheless, it had a lot of elements of the South there. That was another early exposure to the issue of race and race relations and what to do about it.

05-00:11:15

Redman:

Was the actual town/island of Oak Ridge—the downtown was still a happening downtown? There were still shops and cafeterias and that sort of thing?

05-00:11:29

King:

Yes. There's not a lot, because this was just being built in private ownership. Before that had happened, it had all been post exchanges

and commissaries and that sort of thing. There wasn't a lot there. The big event, incidentally, in Oak Ridge, weekly, was the high school football game. There would be a huge turnout at the football field for that huge event.

05-00:11:53

Rubens:

How many students were part of that Practice School?

05-00:11:56

King:

About twelve of us.

05-00:11:57

Rubens:

All MIT?

05-00:11:59

King:

Yes.

05-00:12:00

Redman:

And this was where you were able to start hiking and being outdoors again, is that correct?

05-00:12:07

King:

Yes and no. Not really. California is going to be where that happens. But yes, we went to the Smokies and went to Alum Cave, which took a bit of a hike, and I think may even have gone all the way up Mount Le Conte, which is an interesting tie to Berkeley, because that's the same Le Conte. The Le Contes—when they came to Berkeley—I think it was either from North Carolina or South Carolina. It's the same Le Conte, Joseph, that the mountain is named for.

05-00:12:51

Redman:

Did you have to coerce Jeanne into loving nature or did she already come with that?

05-00:13:00

King:

She came along quite readily in all of this. This will just be a reminder of something we should hit in the future. As we get way ahead in the years and we get to where we want to start doing mule packing trips, where the mules carry all the gear and we hike—this is as we got into our sixties. We had done rather ordinary ones for the first two or three. So then, let's try a big one. We went over Forester Pass and into the Bull Frog Lake area, and out over Kearsarge Pass. The reaction from Jeanne after that trip was, "Why haven't you been letting me do this all these years?" We now have all these mule trips, when, as, and if we get to them. We've been doing the entire Sierra. We're going to do one this summer, and I'm seventy-six and she's seventy-five.

05-00:14:12

Redman:

Well, she has to make up for all the lost time.

05-00:14:16

Rubens:

Were you taking her to Civil War sites? Did you continue—

05-00:14:19

King:

That has never worked, taking her to Civil War sites. Yes, when you drive down to where my grandmother was in Rome, Georgia—she was reaching age a hundred as we were in Oak Ridge. As you drive down there, you do pass through Chickamauga. That's a way to sneak in a Civil War battlefield, but that's the most I could do.

05-00:14:45

Redman:

Shoot out a tire or something. Was Oak Ridge a good place to be in a new marriage?

05-00:14:58

King:

I think so. It was a new discovery and an adventure together. Brand-new for both of us. There were all kinds of things about it that were new. The whole Manhattan Project legacy of it. The government town switching into private ownership. East Tennessee. The various traditions and conventions of East Tennessee. It's always good for a joke between us, even now, to bring up something that relates to the Cas Walker stores. Cas Walker had a TV program there. He was the owner of about six grocery stores around Knoxville. It was a country Western show, but it was a different one. He had Little Robert. This was Little Robert. Little Robert had had a bad life because his legs had been cut off somehow, but he had these stumps and shoes, and he would dance around the stage for Cas Walker. That was the sort of show that it was. Very folksy, homey. Cas Walker had been mayor of Knoxville. I say all of this just to say that there was a certain culture and a very different way of living that we could experience there as an adventure. You'd ride around in the countryside. We did some of that. The washing machine was always on the front porch. Why, I'm not sure. Why do you put your washing machine on the front porch? It sure was there. That was an interesting area.

05-00:16:48

Redman:

Yeah, yeah. And you were just there for about nine months?

05-00:16:53

King:

Yes. It was a summer job plus a semester.

05-00:16:56

Rubens:

Were the other students married? Was there a percentage of—

05-00:17:00

King:

Some were, some weren't. Very good lifelong friends, the Bixlers, were there. That's somebody I've kept up with forever. He had been a student with me at MIT. Went to the Practice School when I went there. We've had some very good friends that we've kept up with from there. They're the ones the most.

05-00:17:28

Redman:

Where did students go if they didn't go to Oak Ridge from MIT?

05-00:17:33

King:

You could do a master's thesis. The Practice School was instead of a master's thesis to get a master's degree. They also had three other Practice School stations. At that time, those stations were Bangor, Maine, in a paper mill. Let me be careful here. Something at Rahway [NJ]. I think it was Hercules Powder at Rahway, New Jersey. And Buffalo [NY], U.S. Steel. Or maybe it was Bethlehem [PA] Steel. One of the steel companies in Buffalo. And in Bethlehem, you could go to one or the other, as I recall. Maybe they went back and forth between those locations. What percentage of the class did the Practice School? Practically everybody did get a master's degree on the way to the doctorate, if you got a doctorate. Many got terminal master's degrees. Maybe about half went to the Practice School.

05-00:18:38

Redman:

Was it competitive in terms of picking your location, or could you go where you wanted to go?

05-00:18:42

King:

If you wanted to go, you could go. As best I could tell, you could pick your location.

05-00:18:48

Redman:

Okay. Interesting. Was this something funded?

05-00:18:57

King:

That's the problem, educationally. If you're going to have such a program, how do you fund it? Now, remember, I have the General Electric fellowship. There was a Practice School stipend that you could get for going. You had to apply for those. Those were given separately. Some got it, some didn't. That's why the Practice School concept has not spread well beyond MIT. In my day as director, I know how those two stations got there. I suspect there are similar stories for the earlier stations. Oak Ridge still exists in '59 to '61, when I'm a Practice School director, but the other two, then, are at Esso Bayway and at American Cyanamid, Bound Brook, New Jersey. The answer on those, I might as well take up here, is that there was an MIT alumnus to whom the department was very close, who was at the right point in upper management to make this happen. His name, for Bayway, by the way, was Frederic A.L. Holloway, who was the one with the paper that I addressed in my doctor's thesis.

05-00:20:30

Redman:

Okay. This is either a really basic question or a really complicated one. Did you like the research that you were doing?

05-00:20:43

King:

The research? I believe I have liked research much better when I am guiding and defining it myself. Now, remember, I did that on my doctor's thesis. But on things like the summer job or the Practice School assignments when I was a student, it was a mixed bag. I don't think it was really a good thing to be doing the entire summer, repeatedly flowing nitric acid into this nickel tube and dissolving it. I didn't learn a lot from that. It didn't have the thrill of the chase that much to it. I love research, but I like it the best when I see and pick and identify the problem and then choose how to go after it.

05-00:21:50

Redman:

I'm curious, too, how did Jeanne go about getting her work?

05-00:22:05

King:

I think we sent out lots of letters before going to Oak Ridge. One was to the University of Tennessee. The University of Tennessee had this experimental farm that I don't remember whether we just learned that fact somewhere or whether we were referred to by Oak Ridge. It is possible, but I don't know, that I may have gone to Tom Mix or somebody had just come back from Oak Ridge, and I said, "So what summer employments are there for a master's degree-carrying chemist?" Cryovac, when we got back to Cambridge, I think she got that through a very conventional way, the newspaper. That type of thing.

05-00:23:02

Redman:

Please forgive me if this is prying. Was her choice to work an intellectual one or a financial one or both?

05-00:23:10

King:

Her choice to work.

05-00:23:16

Redman:

Because at that time, she wouldn't necessarily be thought to be obligated to. Is that correct?

05-00:23:24

King:

Well, I believe she wanted to work up until we had children. That's what ended work. I'm quite convinced she wanted to do it. I'll try to address your economic necessity question. We were, as was very typical of our generation, I think, on our own financially from the beginning. That has changed as the years have gone on. We were. We bought the car that we went to Oak Ridge—I was going to say that we may have been given the car that we drove to Oak Ridge, but that's not true. That was just how things were done. You were on your own. I think she wanted the employment. She had done the chemistry major. She wanted to do something with it. The money was useful. I think the



decision was driven more by the interest and that's what she would like to do, rather than by we need the money.

05-00:24:43

Redman:

That makes sense. She obviously pursued careers that would utilize her degree, and not just something that would bring in money.

05-00:24:52

King:

She's always had a career. We can get to that, too. She had a very different one later on.

Interview 3: May 11, 2011

Audio File 6

06-00:00:01

Redman: After our last interview, you mentioned a really interesting story about being able to drive by an area—I'm not sure if it was outside of Oak Ridge or if it was within the confines—and able to see some discarded pieces of a calutron. Could you tell us about that?

06-00:00:37

King: This was a large tract of land that was about halfway between Oak Ridge and Knoxville, which was the nearby big city. You would drive past this. On the north side of the road was this field full of metallic equipment. That's the tie between Oak Ridge and Berkeley, because that metallic equipment was equipment that was known as the calutron, California University tron, which was Ernest Lawrence's contribution to the uranium enrichment effort, and was one of the very first methods used for enriching uranium. It was, in its essence, a scaled-up mass spectrometer as a way of doing it. The history goes that General [Leslie] Groves had gone to the U.S. government and had acquired a very substantial fraction of the silver in the U.S. Treasury and had turned that into wire for windings on the magnets of the calutron so that they would work and would have high conductivity. The Treasury silver had been used, and yes, the Treasury silver had been given back to the Treasury before they went out there to rust in the fields. So there was a Berkeley/Oak Ridge tie. I did not know the meaning at the time.

06-00:01:57

Redman: Interesting. Before we get back to covering the last part of your graduate career, I realized that I never asked you about your impressions of the launch of Sputnik. Can you tell me a bit about that?

06-00:02:18

King: I certainly do remember when it happened. I remember the huge surprise to the government being taken aback by this happening. I think I probably did not understand it at the time as well as one can in hindsight, because it was the launch of Sputnik that set up a large increase in the federal support of scientific research and also special fellowships, like the NDEA [National Defense Education Act]. So it had a big effect. I don't think I was able to even trace the cause and effect at that point. I was not thinking about where I was going to get my next research grant yet, and so it didn't have that kind of meaning. It was certainly apparent at the time that science rose some several notches in the concerns of the federal government.

06-00:03:20

Redman:

Would you say that the actual launch of Sputnik was perhaps not as important as the sort of representation of Sputnik and the lasting impact?

06-00:03:33

King:

Sputnik carried a message that another country, the Soviet Union, could do something that was a major accomplishment in science, and that it was something that the U.S. had been working towards but was not yet at the point of being able to do. In that sense, Sputnik was a situation that gave the Soviet Union a leg up with regard to what their role and their capabilities in science were. I don't think the federal government and the Congress, or, for that matter, the population in the U.S., cared for that image. That's what brought all the effort to put much more into U.S. science.

06-00:04:18

Redman:

Did you find, as you went through your career, that Sputnik was something that, for instance, your students would continue to talk about? Or was it not something discussed?

06-00:04:30

King:

It was not something they would talk about. In my dealing with my students, be they graduate students or being undergraduates, it would be on the subject matter at hand, which would be some aspect of chemical engineering, or whatever we were doing in research if it was master's and doctor's students. The conversations would be about that research. I don't remember Sputnik ever coming into a conversation.

06-00:04:55

Rubens:

At MIT, were there colloquia or symposiums about Sputnik? Was there a buzz about it on the campus that—

06-00:05:04

King:

I do not believe there was. I think this buzz was in the national media, and it was via the national media, and the ability of the national media to capture the public feeling, that it came to the government and the government then moved.

06-00:05:24

Redman:

Let's get back to your professional career. I understand you were a student at the School of Chemical Engineering Practice, and then you became the director of that afterwards. Can you tell me a bit about how that transition happened?

06-00:05:40

King:

MIT, since about 1914, has had these schools of chemical engineering practice. They have been located at various places around the country, and now, interestingly, around the world. They have stations in Japan, for example. At my time as a student, I went to Oak Ridge, and the

other stations were a paper mill in Bangor, Maine and a steel mill that I think I mentioned the other day, then Hercules Powder in Parlin, New Jersey was the third one. For reasons that I never knew, MIT dropped those three and opened two new schools in about 1957. The two new schools were in New Jersey, and one was the Esso Bayway Refinery up in Elizabeth or Linden, and the other one was the American Cyanamid Plant in Bound Brook, New Jersey. Those were relatively new stations. There was a new director being appointed, at least one per year, because Oak Ridge was a two-year stint for the director, Bayway was a two-year stint for the director, Cyanamid was a two-year stint for the director. One year, they'd be appointing two directors, and the intervening year, one director. There were a lot of Practice School directorships, and it was in that sense a natural thing for an MIT graduate student to think about. In those days, it was always an MIT doctoral student who was chosen to take one of these Practice School directorships. That, incidentally, has changed. For the last ten or fifteen years, they have people who are professional Practice School directors, including one fellow who was an assistant director at my time at Cyanamid, who then had a perfectly good and long industrial career, and reached the point of retirement from that and decided, well, what he would take on is directing Practice Schools again. They have what I would call professional Practice School directors. It's the remainder of their career.

06-00:07:59

Redman:

It's not a two-year commitment anymore? Now it's a career.

06-00:08:02

King:

No longer two-year and new graduate students. That's what it was in my time. I had always had an interest in an academic career. One thing you find out at MIT is that industrial experience is considered to be a very good thing for an academic chemical engineer. Well, how was I going to get industrial experience? I could get it by going to work for a company for four, five years and then coming back into a university, or, it appeared to me, this Practice School would probably be a very good way of getting it. And so it was the idea of two years of something that would give me a base of industrial experience, but yet was an academic track and led me to a university career. That's what attracted me to it. I applied and was given the directorship, and started it in the summer of '59, when I still had—I think we discussed the past six months of straight work, or what turned out to be a year of part-time work, to finish up my doctor's dissertation. As of the summer of '59, Jeanne and I moved to Cranford, New Jersey, and my employment was the Practice School at the Bayway Refinery.

06-00:09:32

Redman:

Do you have a sense of how competitive these positions were?

06-00:09:37

King: I know there were others interested in it, so they were competitive. There was more interest than there could be people taken.

06-00:09:45

Rubens: Why did they want a graduate student to be the director?

06-00:09:50

King: That's an interesting question in hindsight.

06-00:09:54

Rubens: Someone who's had so much administrative experience now with—

06-00:09:57

King: Yeah. There are a lot of things about that Practice School that I think make more sense for somebody who is a career director of Practice Schools. I can understand why they are doing that these days. On the other hand, it was, for me, a wonderful way to get a couple of years of very wide industrial experience. I would have twelve or fourteen projects per semester that these students worked on. I would have, say, three different groups of students. They would work on, say, three different projects, or four different projects, per semester. The number of projects got quite up there, and they were quite varied, all around the oil refinery. I learned a lot about how oil refineries work and what the issues are with regard to keeping them going, with regard to situations where your engineering or science background can be very directly applicable to whatever is needed. I look back on that, and the directorship was very good industrial experience in a way that being a student at Oak Ridge had not been as much. Namely that I was right there, dealing with the people in the refinery, shopping for projects for these students to work on, getting more suggestions than I would use, sifting among them, what are the criteria I should use for picking a project. Then coaching the students. The students would also have somebody called a contact person within the refinery, who was a technical person that they talked to for the technical input and background they needed for whatever the project was. It would be me and my assistant director who would be looking over their shoulder as they did the project to coach them and get them thinking about the right things and so forth. It was very helpful industrial experience. Also, looking ahead, when we get me going here at Berkeley on the issue of case problems as a method of instruction, and basing those case problems in reality, the original case problems came from the Practice School directorship.

06-00:12:27

Redman: Could you just give us a few examples of some of the projects that were being conducted?

06-00:12:32

King:

Sure. An example would be, what is the capacity limit on a distillation column? There's some large distillation column that's performing some separation. Butane from isobutene was one of them, in an alkylation unit. The idea would be to find out what was the throughput capacity limit of this column without knocking the column offline. If you just simply turned up the reflux ratio and started the flows going back and forth to a greater extent in the column, you'll find the capacity limit all right, and you'll knock the column offline for the next three or four days, and cause a big problem to the entire integrated refinery. That's what you have to avoid. Finding a way of determining the limit without knocking it offline or having the risk of knocking it offline, that was one type of problem.

Another would have been capacity limits on heat exchangers to find out what was the max they could do. Another would be to consider changing solvents in a unit that made a motor oil additive. We did that. I remember simulating reactors and trying to understand how the operating conditions of a unit could be optimized so that you had the same capacity, but with less energy consumption. We did that on the fluid catalytic cracker, which is a huge, huge, huge piece of equipment in an oil refinery. Then also things like the polymerization reactors, what was called the poly plant, which made a component of gasoline. We also had a project on gasoline blending and how to put the various components together in the most effective and efficient way.

06-00:14:48

Redman:

I'm curious how you would characterize the breakdown of how much of the work was theoretical, how much was experimentation, how much was trial and error. I'm sure it varied by project.

06-00:15:04

King:

It did indeed vary by project, but that's one of the principal challenges, is to find a project and coach the students on the project so that both are there: the ability to exercise their theoretical knowledge, and yet dealing with a very practical situation. That was one of the prime criteria in project selection, was to get that in play.

06-00:15:34

Redman:

I'm not that familiar with how the organization of the Practice Schools fit into the larger field of chemical engineering. Were these projects that students were working on—I assume that they had a sort of practical impact. Were there products coming out of the refinery, for instance?

06-00:15:58

King:

Sure, gasoline.

06-00:16:00

Rubens: What was the company?

06-00:16:04

King: Esso, which now is called Exxon.

06-00:16:09

Redman: To sort of paint us a picture, what were the facilities like? How big was this place?

06-00:16:18

King: Oh, the oil refinery was gigantic. This is the oil refinery that is cut in half by the Jersey Turnpike. As you go down the Jersey Turnpike, north to south, you have Elizabeth, which is exit thirteen.

Then you have Linden as an exit, and then you go on further south. New Brunswick, eventually. This is in Linden [NJ]. The refinery was on either side of the Jersey Turnpike, because the refinery came first, and the turnpike came later. I would say something like half to three-quarters of a mile, north to south, and maybe half a mile, east to west.

06-00:17:16

Redman: It was, for lack of a better term, a campus? It was a closed—

06-00:17:23

King: An oil refinery is taking crude oil in and it's turning out products, the main one of which is gasoline, but there's also heating oil, there's jet fuel, and there will be streams that are used for the manufacture of petrochemicals. In the case of Bayway, they made some petrochemicals, so we had an entire ethylene plant there. That was a favorite place to work. The whole thing is integrated together because the feeds come in—there's not that much holdup of material within the refinery—and the products come out. This is all continuous, twenty-four hours a day, every week, yearlong. It's a big deal to shut down the refinery, so it's very tied together. You can see one of these here by driving out to the Richmond-San Rafael Bridge, and look to your right, and there's the Chevron Refinery. Same thing. Same size. Same many distillation columns, et cetera.

06-00:18:24

Redman: I assume that there were plenty of people who were not associated with MIT working there as well.

06-00:18:28

King: Yes, indeed. Lots of employees. Esso had employees who kept it going. In my Practice School directorship, we started off in a small building right out in the refinery, which had the quaint name of the Flit building, Flit being a product that you used in a pressure spray to kill mosquitoes, flies. An early insect prevention mechanism. We had interesting issues of residual contamination in the Flit building. There

was Flit in the Flit building. Eventually, towards the end of the first of my two years out there, this building was actually taken down by the refinery. We then went back into the main office building. That's just an aside.

06-00:19:22

Redman:

So the students involved in the Practice School, were they integrated with other non-MIT employees, or was it kept fairly separate?

06-00:19:33

King:

No. It was student teams that did the projects. They would do the project as a team. The agreement with the refinery management was that they would work as a team, separate on the project. They would, however, have this contact person. The contact person was a resource with regard to information and to run a plan for a test of a capacity of a distillation column through, so that indeed that person could determine that they were not going to knock the whole refinery offline. It was only in that way that the students interacted with the rest of the employees. Pardon me. There was another way. There are people known as operators out on these different units of the refinery. There would be a set of operators for the cat cracker, a set of operators for the ethylene plant, and so forth. These are non-technical people, probably not college-educated, and they are in those roles as a lifetime career. There was another challenge to the students, which was how do you work effectively with such people, rather than coming across as the abstruse egghead who they're going to not want anywhere near their controls and equipment and whatnot. So there was some training there, too, on how you work with people.

06-00:21:03

Redman:

Were you working on projects yourself or were you overseeing projects, mainly?

06-00:21:07

King:

I was working on one project during the first year, and that was completing my doctor's thesis. I do remember the day, now that you bring that up, when I was doing drawings for my doctor's thesis. Of course, in those days, you did drawings with a pen and ink and a straightedge and a compass and all that. There were things called drawing kits or sets that had all of these implements for making engineering drawings. Here I was, doing one of these for my doctor's thesis, when all of a sudden, behind me—I was in the office building at that point—was this loud noise. The result was that ink went all over the page and I had to start the drawing again. I turned around and there was a flame coming out of the catalytic cracker. There had been a major explosion in the refinery. There were those episodes, too. Hopefully, our students did not cause any explosions, and I am not aware that they caused any. The one such thing I am aware of and I



remember well from our days is when a student had a large monkey wrench in his back pocket and he was walking around on the top of what were called fin-fan condensers. They're finned tubes for the heat exchange, and then driving air as a coolant over these tubes is a big fan. The monkey wrench fell out of his back pocket and went clankety-clank down through the tubes, bending the fins and whatnot. Hit the fan and knocked out the fan. That's the most we did.

06-00:22:41

Rubens:

You were lucky.

06-00:22:52

Redman:

You, up to this point, really hadn't taken a leadership role in directing research. Was that a challenge, especially because you were directing research for people who weren't much further behind you in their graduate career?

06-00:23:10

King:

Well, I actually liked that very much. I would say that's the first role where I found that I did like to organize and manage things, and that I might actually be able to do it rather well. I relate back to my days as a Boy Scout in Massachusetts to get an Eagle Scout award there. The concern about me, expressed by my parents and by the Scout Master was, well, where are his leadership skills? I don't see his leadership skills. So built back into some compartment in the rear of my head was the idea that I don't have leadership skills. So to actually go out and do something like this and find that it was fun and that it worked well was very revealing to me. I count that as a very important part of my career for that reason.

06-00:24:04

Rubens:

Is that part of the strategy of MIT and setting that up? I still wonder why they would give that kind of position to a graduate student.

06-00:24:17

King:

Let's back up as to why there is a Practice School. Of course, the reason for that is so that there could be people who got a master's degree by doing things that were practical and quite directly preparative for their careers. It's a difficult thing to sell economically, and I think we may have discussed this before, but it was very important that there be a friend in a high place in the company you were going to have a Practice School with. Now, back to why to use the graduate student. I see it as a wonderful educational opportunity for me. There's no question of the value of it to the director as an experience. I think MIT did see that fact. There's the question of faculty structure and status, too. These people, nowadays, who are professional Practice School directors there, they hold the title of—probably not professor. Probably something like adjunct professor.

They do not have the standing and status of a regular professor. They're not doing the research. They're not getting the national name. They're not part of the reputation of the department. So they're different people. Now, is it better to have some such people in the payroll and have the Practice School stations work well because they're there and they're the ones doing it, or do you try to get your best and your brightest graduate students? If you get your best and your brightest students, they cost less. That may have been a factor.

06-00:26:15

Rubens:

But you were called—is this right?—an assistant professor.

06-00:26:18

King:

Yes. It was a term appointment as assistant professor. That's what was done for all Practice School directors. It was not tenure track. I guess that's another way to put it. Tenure track was, to me, a new term when I came to California. This was definitely not tenure track. It was a contract appointment, and so they could either use some other title. They could have used adjunct, but that may connote a degree of seniority that these graduate students did not have. They could have used instructor, and maybe that would have been a better one to use. What they did use was assistant professor, but not as a career assistant professor. There were other people, way fewer of them, who were career assistant professors.

06-00:27:09

Redman:

Did you have any say or any input into the choice of students that went to this Practice School?

06-00:27:17

King:

The way this was operated was that there was a director of Practice Schools, who was a faculty member back in Cambridge. That, in my day, was a man named Bob Reid. Bob Reid was a regular faculty member. Had his own research, wrote books, taught courses. He had the service responsibility to the department of overseeing the Practice Schools. He was also the admissions officer for the Practice Schools, so I had nothing to do with who came. What happened is that if a student was interested in going to a Practice School, they applied. Bob Reid received the applications. Bob Reid decided who would go where.

06-00:28:03

Rubens:

Was he your superior, then, in that—

06-00:28:05

King:

Yes, he was my boss. The three of us who were out directing Practice Schools, and our three assistant directors, would go back twice a year to MIT for a Practice School directors' conference, where we shared problems and agonies and opportunities and whatnot.

06-00:28:30

Redman:

Are there any useful comparisons between your experience at the Practice School in Oak Ridge, and then the experience of the students at this Practice School?

06-00:28:41

King:

I believe that the Bayway Refinery Practice School was far more practical. It was a production plant, with everything that goes with a production plant. An ability to shut it down, operators, connectedness internally with all the huge streams of liquid back and forth between the various units. This [the Oak Ridge Practice School station] was actually carried out through the Oak Ridge National Laboratory. That was a national lab. It was largely a research national lab. So the Oak Ridge projects were not exclusively but tended to be research projects. That's different from a practical production plant project. In terms of what engineers do and what they need to prepare themselves for later life, I think the Esso one was much better.

06-00:29:39

Redman:

Interesting. You had mentioned that you and Jeanne moved to Cranford. Was this a move that you did the planning for yourself, or was there housing available through—

06-00:29:54

King:

Which move was this?

06-00:29:55

Redman:

When you moved back to New Jersey. Was housing available through this—

06-00:30:00

King:

We were on our own with regard to housing, but there was another function of the job that had to do with housing. We got ourselves a place in the Cranford Garden Apartments, I think it was, right on the edge of the Garden State Parkway, which was the other big, new road in New Jersey at the time. The students also had to be housed, though. There would be twenty-five of those at a time in New Jersey, half at Bayway, half at Cyanamid. There had always been some difficulty getting housing for those students, impermanency of housing. I made a housing arrangement early on there, working with the Cyanamid assistant director, for a large house in sort of the center of Cranford, New Jersey, which is a very residential suburban community. We had the twenty-five students in the home. The owner, very obligingly, happened to own a vacant lot next door, and so he covered it with gravel for the students to park their cars on. This occupancy and that parking lot were not attractive to the neighbors, who were perfectly ordinary suburban people, and relatively well-to-do. So I went through quite a thing where there was one of the neighbors in particular who complained regularly to the zoning department enforcement of

Cranford. We were actually served with a notice of improper occupancy. We had investigators from the city come in and look at the occupancy over Thanksgiving weekend while the students were gone back home. There were questions like, do they cook as a family or do they cook separately? Bless the souls of these young people, they all cooked individually with their little frying pan over what one of the burners on the stove they could get access to. So they were living as individuals. This eventually went to court, this occupancy. I had my first introduction to modern-day legal proceedings, something which served me very well in my later career.

06-00:32:39

Redman:

Well, what happened?

06-00:32:42

King:

What did happen? After I had completed my two years, the lease came up, and so we simply did not renew the lease. In fact, the owner had broken the lease. This was a winter when New York City had its streets blocked by a big snowstorm and Mayor Wagner had closed the streets of the city. We had had a furnace breakdown and the owner did not fix it and could not fix it, so that amounted to a termination of the lease. I think we used that fact that our students had been left there with no heat whatsoever in this cold wave as a rationale for breaking the lease. The students were then distributed into a number of different apartments. I think they went down to Plainfield at that point.

06-00:33:42

Rubens:

Were these all male students?

06-00:33:45

King:

Yes, they were. The nature of engineering at the time.

06-00:33:53

Redman:

Was Jeanne working at this point?

06-00:33:57

King:

Jeanne was definitely there. Is she working in Cranford? No, she's not working in Cranford, because we have children. Our first daughter was born in March of 1959. It was July of '59 that I started with the Practice School—actually, September.

06-00:34:26

Redman:

Okay, so your first daughter was born in Oak Ridge? Is that correct?

06-00:34:29

King:

Was born at Mount Auburn Hospital, Cambridge, Massachusetts.

06-00:34:32

Redman:

Okay, so back in—okay.

06-00:34:35

Rubens: And her name?

06-00:34:36

King: Mary Elizabeth.

06-00:34:42

Redman: After your directorship, do you go back to Cambridge?

06-00:34:47

King: I go back to Cambridge, because it's a three-year appointment. In my case, that appointment was lengthened by a year. I really don't know whether that was because they needed teaching help to help fill in at that time or because I was being looked at with regard to something more possibly. In any event, I went back to Cambridge and did a year and a half of teaching before I went off, accepting the job at Berkeley.

06-00:35:22

Redman: What did you teach there?

06-00:35:27

King: One thing that was very important to my career that I taught was process design, but I also taught a course in industrial stoichiometry and thermodynamics. S-T-O-I-C-H-I-O-M-E-T-R-Y. It means describing, in a quantitative way, chemical reactions and processes. The stoichiometry of a chemical reaction is how many of A react with how many of B to form how many of C. That's called the stoichiometry of the reaction. Anyhow, those are the things I taught. Process design was an important one for me because that was with Tom Sherwood, who was the one I had mentioned earlier that I might have done my dissertation research with. Tom was now back from Berkeley. He was writing a little book, the components of a little book, which became published by MIT Press and known as A Course in Process Design. It was a case problem course, which was a new approach at the time, to take a particular situation, a real situation, write it up as a problem, and get the students to go through the logic of coming up with a solution to the problem. Almost always, it is truly a solution rather than the solution, because there could be many solutions. I did one on multi-effect evaporators and the way they were linked together and how to describe them and how they would respond if something changed. Sherwood liked that enormously, and it did end up in his book, as I think the one chapter that he did not write himself. That, I believe, is where Sherwood got a sense that I might be somebody who could do good things, and that will lead to even better things as we come to the move to Berkeley.

06-00:37:53

Redman: What were some of the biggest challenges that you faced in the classroom? This was the first time that you had taught a course.

06-00:38:05

King:

When you're teaching a course for the first time, and of course all those courses were for the first time, there is the issue of staying one or two or three jumps ahead of the students. The most challenging and interesting thing is, particularly with the MIT convention on teaching, you're going to have a lot of discussion, you're going to have a lot of questions thrown at you by the students in the class, and you'd better be able to deal with those questions. I think the greatest challenge was mastering the subject matter, out in front of having to transmit it to the students, so that I was in a situation where I could deal intelligently with whatever questions they brought up. That was one challenge. That's probably the largest single challenge right there.

I'll add something else about that year and a half back at MIT, too, which is just a piece of incidental information. That is that MIT at that time had the requirement that undergraduate students do senior theses as part of their undergraduate degree program. This was my first opportunity to define and oversee research, although it would be pretty short performances of research by the senior students. I had three students sign up to do research with me. This is where it becomes interesting, because two of those three were twins, and their names were David and Bill Koch. K-O-C-H. You now read about David Koch in the newspapers. My pedagogy did not work on David Koch. I did not affect his politics at all! He and his brother Bill were non-identical twins. David, as many people now know, went on to become a principal of Koch Industries, along with one of his brothers, named Charles. Bill and one other brother got bought out by the two brothers that stayed with the company. Bill believed he was not paid enough for his share of the company, and so there was this big, horrible trial, with the mother of these men being put on the witness stand and treated rather harshly. Very gory, big trial. It ended with a total break between the two brothers, who had each done projects with me.

Bill then went on to found something called Oxbow Engineering, which is in Cambridge, Massachusetts. Became interested in sailing in the America's Cup. Won the America's Cup with a boat that was specially designed with MIT engineering that he had gotten various faculty to contribute. He was also the one who came back on the defense of the America's Cup with an all-female crew, which didn't succeed in the defense, but nonetheless was quite an interesting step at the time. Bill is a big benefactor of art museums. David, I just saw in the paper a day or so ago, he and Charles are categorized as the fourth and fifth richest people in the U.S., which they probably are. Not that I had anything to do with David and Bill's subsequent career, but that is an interesting thing that two of my three research students there for that year at MIT were those folks.

06-00:42:04

Redman: The poor third guy.

06-00:42:05

Rubens: They had had a family business—

06-00:42:07

King: Oh, yes. The father, Fred C. Koch, was the son of German immigrants. He started Koch Enterprises, which is a huge oil refining operation in Wichita, Kansas, and which is now branched into all sorts of other things. I have a good friend, Bill Eykamp, who was the CEO of their membrane company for a number of years. They're into all sorts of things, and very active behind the scene in conservative and Tea Party politics. Not Bill, though. In fact, my guess is that Bill may be a Democrat.

06-00:42:54

Redman: How would you describe your relationship with the other faculty in the department?

06-00:43:02

King: I was still sort of in a state of awe, being a youngster back there. This was the department of all the granddaddies of chemical engineering, the great names. There was, for example, Doc Lewis, Warren K. Lewis, who, along with Ed Gilliland, had co-invented fluid catalytic cracking—doing it with a fluidized bed. That had come in and revolutionized oil refining. So big, big names. But there was an interesting tradition to the department, which is that there was the coffee room. The faculty drifted into the coffee room around ten o'clock every morning, and Doc Lewis would be in the coffee room. Here is an opportunity to be there, Doc Lewis waving his arms all over the place, as he would do, holding forth on whatever. That, to my very impressionable self at the time, was a marvelous, marvelous experience. There was that kind of mentor/neophyte relationship. There were also other junior faculty, and I interacted with them quite a bit, socially and otherwise. I do remember a time that Sherwood had us out to his place in Concord, which was in view of the crude bridge that arched the flood, if you remember your Longfellow poem, where the revolution battle had happened. We had a barbeque out there with probably twenty or twenty-five people. Very enjoyable socially. That was a good experience. Also in those years, Jeanne and I lived in Weston, Massachusetts. I had a bit of a commute coming into MIT. That was the first time we actually had a house with a yard and other such things. There's another part of our growing up.

06-00:45:30

Redman: Was it common for graduate students in the department at MIT to take a position like this?

06-00:45:40

King: One and a half per year had to. They had to keep the practice schools going.

06-00:45:47

Redman: Well, but to take a—oh, I see, because this is—

06-00:45:50

King: I should make one thing clear. It was not necessary that you still be a graduate student in order to be a Practice School director. In fact, in that sense, I think I was somewhat unusual. Not totally unusual. There were other Practice School directors who were recent ScD [Doctor of Science] graduates. ScD was the degree MIT gave at the time.

06-00:46:13

Redman: So this teaching appointment back in Cambridge was just simply part of your contract of being a director?

06-00:46:23

King: Yes. I always knew throughout that that I should be looking for something else that would be the start of my professorial type career.

06-00:46:39

Redman: Did you enjoy teaching?

06-00:46:41

King: Sure. Hugely.

06-00:46:42

Redman: Did you think that you would?

06-00:46:48

King: You don't know until you do it. I remember the two or three doctor's colloquium seminars that I gave during my dissertation as being somewhat scary events. Can you remember what you're going to say, and how often you look at your notes. I even had one very creative step, which I got called on, which was, for the seminar, to utilize a blackboard in the back of the room to write notes to myself on what the outline of the presentation should be. That got pointed out to me by one of the faculty in a question, as if it had not been the right thing to do. I still think it was kind of creative.

06-00:47:36

Redman: I like it. At this point, you had mentioned that you and Jeanne were living out in Weston. I would assume that, with finishing up your degree and being a first-time teacher and having a new family and the long commute, you were really starting to have to balance work, your career, and your family. I'm sure there were a myriad of challenges with that. Can you comment a bit on that balance?



06-00:48:16

King:

Certainly, we kept up our social life. We had friends. We would do things with them and see them back and forth. We had just the one child. Let me get this straight. I'm getting my years wrong. We had two children then, because Cary was born in April of '61. I remember a lot of work, raking the leaves in the yard. They were all over the place there in New England. Yet I don't think I really had the feeling of a large amount of things to do and the need to balance. You could pretty easily do them all. Yes, you should be doing something at all times, and if you didn't, you could fall behind. But with regard to the ability to balance and do many, many things and take an ever-increasing workload, I think that's just something that grew on me over the years. I found I could do it. I didn't really have any special methodologies for how to do it, other than the fact that I am an organized sort, so I try to keep in mind the things I need to do, and I try to do continual prioritization in my mind of what is the thing I should be doing. That, of course, became hugely important in getting into these larger administrative jobs.

06-00:49:45

Redman:

There's that saying, if you need something done, ask a busy person. I suppose that's what you would say about your life.

06-00:49:52

King:

I'm afraid that's happened too often. I have a large tendency to say yes.

06-00:50:02

Redman:

At this point, you're also thinking about moving on. You had mentioned earlier that you thought that your appointment with MIT might have been lengthened because they had some interest in you. Are you saying that in terms of perhaps keeping you on longer or—

06-00:50:21

King:

I think they may have been thinking of that. I honestly don't know. The reason I said that they might have been thinking of it, remember, it was a three-year appointment as a Practice School director. Two out of the Practice School and one relocation year. Although I don't remember the specifics, at some point during that relocation year, I was told they would like to do another year, and I said yes to it. I had a fourth year, which I didn't complete. I was looking, I would say, probably spring of '62, for what would be other positions. Two happened. The first one was that a fellow named Joe Bergantz, a 1941 graduate with a doctorate from MIT, was starting up chemical engineering at an entirely new university system known as the State University of New York. The Buffalo campus in particular. They [the State University] had taken it over. It had formerly been the University of Buffalo. Indeed, a very well-known chemical engineer had been the

head of the University of Buffalo for many years, Clifford Furnas. Bergantz was building chemical engineering and came to MIT looking for people to do it, and became quite interested in me. I went to Buffalo, toured what they had, had dinner in the Millard Fillmore Club, and all sorts of good things. Later, but before this, Berkeley came into the picture. The offer that eventually came from Bergantz—it surprises me very much in hindsight—was to be an associate professor with tenure from the beginning, which is not real good for having somebody build their research career and evaluating how they do it. Anyhow, that's what the offer was. Then the Berkeley—

06-00:52:47

Redman:

I'm sorry to interrupt. At the time, did you think this was odd, or was it only in hindsight?

06-00:52:51

King:

I thought it was impressive. I didn't think it was odd at the time. In hindsight, I think it was odd. So now Berkeley.

06-00:53:12

Rubens:

To clarify, what's the nature of the industry at American Cyanamid.

06-00:53:29

King:

Oh, that's a very interesting one. That was manufacture of a whole lot of smaller-scale chemicals, like dyes, and even some things that would become commodity products. The interesting thing about it is that there were rather few chemical engineers employed at American Cyanamid. That was not true of Esso. Esso had lots of chemical engineers. The lack of chemical engineers at Cyanamid was striking in some ways. I remember one story. I never saw this in the flesh. One story is that, for a grinding operation, the apparatus to do it had been designed as a scaled-up mortar and pestle. Those of us who've ground up things in the chemistry lab know that a pestle is a little ceramic bowl, and a mortar is something you turn around in it so to accomplish the grinding. Now multiply every dimension by a hundred, or five hundred. You've got what was reputedly built at American Cyanamid. It was a place where a little bit of engineering could have a big impact. I think, in some sense, the Practice School students did more for American Cyanamid than they did for Bayway because of the real absence of engineers at Cyanamid on the permanent staff.

## Audio File 7

07-00:00:01

Redman:

We just, off-tape, have been asking you about your dissertation, so if you could recap that, that would be great.

07-00:00:19

King:

My dissertation was quite a long document. I think something like 650 pages. I can check [446 in actuality]. It's on my shelves in there. It had appendices, which were various side projects, one of which, incidentally, became a paper of mine on what is called the additivity of resistances in mass transfer processes. It actually is a paper that I look back on quite fondly, because it made something of a splash at the time, and yet it was a side product of my doctor's dissertation. So here was this long doctor's dissertation. In those days, of course, no computer, no copy machine. There was beginning to be used something called a thermofax that would make copies, but you had to keep them away from the radiator or else they would blot out. I engaged, for the typing of my thesis, the administrative manager of my Practice School office, who was an interesting person. I'll talk about him before I get to the dissertation. This was Alan Whitney. Alan Whitney had been principal administrative assistant to the refinery manager, the head of the whole refinery. The successor wanted somebody else as administrative assistant, so Alan was available. Alan got assigned to the Practice School. Alan was also a great thespian. He was a director and a performer in the Cranford Dramatic Art Association. I remember once Jeanne and me going to see him as Uncle Harry. I think the play is called "Uncle Harry," although it may have another name. He was a quite dynamic performer. When it came time to type my dissertation, Alan volunteered to do it, and I volunteered to pay Alan something that was probably not much at all. I don't remember what it was. So now these 500 or so or 600 pages had to be typed, and I believe it was eleven copies, on a typewriter, with eleven pieces of paper going into the typewriter and ten pieces of carbon paper sandwiched in between. He would type away. If there was a mistake, of course, what you had to do was to take this piece of sort of manila folder paper and stick it between each of the copies, do an erasure, and retype. That was quite a production, typing the thesis. Times certainly have changed, with computers and with copy machines.

07-00:03:13

Redman:

We also, during the break—not so much of a break, I guess—talked about the concept of a Practice School being implemented in other places. You said that it never succeeded.

07-00:03:30

King:

Yes. The idea has been taken and worked with in some other instances. The one that I remember best was an effort by many or all of the Big Ten universities to work something out that involved the Argonne National Laboratory. That lasted for seven or eight years. But there's not been an equivalent of the Practice School that has taken hold at some other major university, at least, and caught on in the same way. Yet, within chemical engineering circles, you hear a lot of discussion

of what a good thing this is, and why isn't it done here. I look back on that and I think the reason is the finances. You've got to pay a Practice School director. You've got to pay an assistant director. You've got to get students out there. If those students are at the graduate level, they would be getting fellowships or assistantships back at home base, so there has to be some way of providing financial support to the students, and where is that going to come from? It's not going to come from the National Science Foundation or government grants. It has to come from the corporation. The corporation has to be willing to come up with the money that's required to make this work. They also have to be willing to have these pesky students running around, upsetting apple carts here and there. It really does take a friend at the top. I know Fred Holloway had that role at Esso, and I know also that Kenneth Klipstein, Vice President of American Cyanamid, had that role for the Bound Brook station.

07-00:05:12

Redman:

So MIT has this program because of personal relationships?

07-00:05:17

King:

And the ability to do it. They really do believe in it. There's another way to tie things together. The financial situation has been alleviated, and the whole Practice School is now known as the David H. Koch School of Chemical Engineering Practice.

07-00:05:32

Redman:

Interesting. We had almost reached the point where you were going to tell us about officially making the decision to go to Berkeley, but before that, you had mentioned that you did briefly considering taking a position at General Electric. Was there one offered to you? Tell me a little bit more about that.

07-00:06:01

King:

Well, you're a graduate student. There's a placement center, and you do some interviews with industry. I think I did at least one interview with General Electric. I believe also that offers for summer jobs and such things came from Schenectady. I didn't accept one of those, but I'm sure I could have used the launch pad of those interviews and of my having held a General Electric fellowship to have employment with GE if I had wanted. But really, the bent towards an academic career is there from very early on. The reason is liking teaching. Also liking students. That is sort of the same explanation for having been Scout Master of a Boy Scout troop for a lot of years, when we get to that. I like those things, but I think there's another factor for an impressionable youngster, and that is you're in a situation, and you're here, and there are some superiors here who are better at doing whatever you do because they've done it longer. Gee, I want to be one

of them. So just following up in a very classic way. Admiring one's mentors and wanting to follow them.

07-00:07:25

Rubens:

How much was there involvement or participation in organizations? I guess you'd call them professional organizations that had an academic—

07-00:07:38

King:

My involvement?

07-00:07:39

Rubens:

Yeah. Because you will publish a paper from a conference that you attended.

07-00:07:45

King:

Yes. This is the paper I published while a Practice School director, on quality control. That was the result of an organization having come to Bayway and it having gotten to me within Bayway that they had a conference and wanted something like this. Gee, we just did a project related to it; why not turn it into a paper and present it? So there was that. But I think the thrill of research and the appeal of research probably started during my doctor's dissertation, because it was so self-defined that that gave me an indication of what it would all be like. That was an enjoyable process. Lots of deductive reasoning. I had Sherwood drumming into me that there was synthetic reasoning, too, putting things together to get new ideas. He used the word synthesis in connection with the little process design book he was doing. The thrill of the chase and research came along later, really.

07-00:09:21

Redman:

You said that you began in the spring to look for a new job, basically. What was that process like? Did you send out applications? Did you speak with people?

07-00:09:31

King:

No. They came to me. I mentioned Joe Bergantz, from what had been the University of Buffalo, now SUNY Buffalo, came to MIT to seek people out, was led to me, found me, wooed me, tried to interest me in being one of the people to found chemical engineering there. A very interesting contrast to California, by the way, considering the climate of Buffalo. The Berkeley story starts with a visit of Charles Wilke, who was the principal early chair of chemical engineering at Berkeley. I believe he and Sherwood had actually had reciprocal sabbaticals. Sherwood had been at Berkeley the year I was choosing a research advisor for my dissertation, and Wilke had been at MIT on his sabbatical. That would have been probably '60-'61 academic year. My second year out at Bayway, directing the Practice School station. I think it was probably in the spring of '61. Wilke came down to New

Jersey to see the Practice School stations. I've forgotten whether I've said this before or not, but I believe he was put up to this by Sherwood, and I think part of this was to look me over. I think this in hindsight. I didn't know it at the time.

So I had Wilke for a day, or maybe it was a day and a half, at Bayway. We toured the refinery. I remember going up and down all eleven stories of the catalytic cracker with him. We related quite well. Sherwood maintained this relationship with Berkeley. The final chapter of the Sherwood story is going to be that he actually comes to Berkeley after retiring from MIT and is a visiting professor at Berkeley for something like six years up until his death. So there was this very close relationship between Sherwood and Wilke. They also eventually authored a book together. Sherwood, I believe, had put into Wilke, either before he came down to the Practice School or certainly in 1962, the idea that I might be somebody to look at for the faculty. I got this correspondence from Charles R. Wilke, University of California at Berkeley. Would I be interested in this? I knew nothing about Berkeley, and very little about California. To assess that one, I went in to Sherwood, who I knew had the contact, and asked about Berkeley. He gave me quite a sales pitch on Berkeley. It was a wonderful place and chemical engineering was going to blossom there. It had started late, which is another important part of the Berkeley chem-e story, but that it was now building, and the money was there for it to build, and there were good people already there, and there would be more good people in the future.

I had that one [offer] arrive during the fall of 1962. I'm learning more about that as I stave off Joe Bergantz from Buffalo so that I can make the best decision I can. Jeanne is part of this decision, too. She has some influence over where she lives, or should have some influence. We ended up picking Berkeley, largely because of the rave review from Sherwood, and also because it would be an interesting adventure. We knew what Buffalo was. California, San Francisco, and the West Coast, and the different climate, and all kinds of things like Spanish missions and what have you would be a great adventure. I know that as we left, the idea in both of our minds was, this will be fun. Let's do it for a few years. We can always come back.

07-00:13:56  
Redman:

I can't help but remember that you had said that your parents had for years hoped to be stationed in San Francisco. I'm wondering if there was sort of a sense of satisfaction that you were able to do this. Your family dream.

07-00:14:19

King: Maybe. But I think the more dominant factor was, oh my god, they're going 3,000 miles away; will we ever see them? That arose in both families.

07-00:14:34

Redman: At this point, you still just had only two children?

07-00:14:38

King: Yes, that's correct.

07-00:14:44

Redman: Speaking of adventure, I would bet that your actual trip out to California was probably somewhat of an adventure. How did you get out there?

07-00:14:56

King: We drove. We drove in the middle of winter, because this was going to start January of '63. It was to start on whatever day was the first day of classes, under the old semester system. So we drove, and we loaded it all into a '57 Chevy station wagon. That included the two children and the cat, who had been acquired in Weston. The cat had an orange crate to travel in, except we started by letting it roam the car. That turned out not to be a wise thing to do. Then he was in an orange crate. We took eleven days to come across country. We took the very southern route, because we had been advised you never go over the Rocky Mountains in the winter.

07-00:15:50

Redman: Yeah, I've done that. You never do that.

07-00:15:54

King: Of course you can perfectly well go over the Rocky Mountains in the winter, but leave that aside. We went south. We went back to Oak Ridge again as one of our early stops on the way. We went through Baton Rouge [Louisiana] and then Houston, which enabled me to show Jeanne some of where I had lived out there, to San Antonio [TX], where my cousin was living at the time. Had the car maintained in San Antonio, and then went on through Del Rio [TX] and El Paso [TX]. What's Deming in, New Mexico or Arizona? I think it's in New Mexico. And then Winslow, Arizona. Stopped in San Diego [CA], where my great aunt was wintering. She is an interesting individual. She was the younger sister of my mother's mother, my grandmother. She, as a real youngster, had married one of the original settlers of Cripple Creek, Colorado. He was a banker. He was not a miner. Cripple Creek, of course, was a big gold, I think—maybe silver—venture, right behind Pikes Peak. He died after a year or a year and a half, of tuberculosis, I think it was. My Aunt Madge stayed in Colorado all the rest of her life, took up a sheep ranch on the Elk

River, north of Steamboat Springs, and lived by herself, raising sheep. This was now her later years. She was in her eighties as we went west. She was wintering in San Diego, so we went and visited Aunt Madge, and then came up the coast, Ventura and so forth, to Northern California, and discovered, even though it was January, things were in bloom. How could that be? That was the trip west. The cat did make it, by the way. Escaping, however, in a field in the very western part of Virginia, bounding off the snowdrifts, with me chasing him. I caught him. I remember another time, the cat went into a motel with us, under my raincoat, with the tail sticking out.

07-00:18:19

Rubens:

Did you know anybody in Berkeley at all?

07-00:18:22

King:

No one whatsoever. Neither of us did.

07-00:18:25

Redman:

Where did you first live?

07-00:18:28

King:

We first lived at 2662 Hilgard Avenue, which is just north of Leroy on Hilgard. This had been gotten by my contact, named Ruth Fix a very good name, very appropriate name, Fix who was the administrative assistant of the chemical engineering department. Gee, we're going to need a place to live; can you recommend anything? Little knowing that this wasn't done, to contact somebody in the university to find housing for you. Alan Foss, a professor who'd come to us two years before, he and his wife had lived in this first-floor apartment over on Hilgard and had just given it up to buy a new home. She actually went over and looked at the place, said, this looks pretty good, and so we put our money down on it and took it. I walked to work.

07-00:19:27

Redman:

I'm sure that there was culture shock. What culture shock did you experience coming out to California, out to Berkeley? It was a totally new experience.

07-00:19:47

King:

Well, it was an opportunity to explore. Jeanne and I are explorers. The Sunday drive was in vogue back then, and we would take Sunday drives all over the place. Mount Tam, Palace Legion of Honor, wherever. The top of Mount Diablo. Did a huge amount of that. Got to Yosemite for a weekend or two fairly early on. That was, of course, awe-inspiring and wonderful. The culture shock was a pleasant one of finding we could do these things. Furthermore, you could do it all year round, and you didn't have snow keeping you in for the winter, nor miserable humid heat, as in the East Coast, grounding me, at least, in the summer. That has always been a magnificent aspect of Berkeley



for me, which has been that the climate is just right for keeping me functioning at an optimal level. I don't think I would have had the career I've had if I had stayed on the East Coast, just because of climate reasons.

Now, with regard to other culture shock, you must remember that Berkeley was a pretty traditional city at that time. It had a Republican mayor, Wallace Johnson. San Francisco had a Republican mayor, George Christopher. It was not the political climate that one nowadays associates with the Bay Area and with Berkeley. Hippies, et cetera. This was not particularly a California phenomenon. The way of living being pitched more to the outdoors was wonderful. We just fit right into it and enjoyed it. In that sense, I don't think there was a culture shock. I think there was a culture lure.

07-00:21:11

Redman:

And neither of your children were school-age yet, is that correct?

07-00:21:49

King:

That's correct. They were babes in arms. Little toddlers.

07-00:21:54

Redman:

In orange crates. So you began here at Berkeley as an assistant professor of chemical engineering. I'd like to learn more about the department. You said that it was a late bloomer. When was the department established?

07-00:22:12

King:

Okay, let's do that. Chemical engineering at Berkeley has a very interesting and unusual history. First of all, it started very late for a chemical engineering department at a major university. It started in 1946. MIT started in 1890-something. Or maybe even 1888. A lot of the big ones, like Michigan, were in existence back in 1905, say. There were quite a few chemical engineering departments. So this was late. Chemical engineering had come about at Berkeley actually in two locations. G.N. Lewis, who was a professor of physical chemistry and Dean of the College of Chemistry. Wendell Latimer became the dean of the College of Chemistry in 1944 and he was very different from G.N. Lewis. Lewis was magnificent. Trained more Nobel Prize winners than anybody who ever lived. But to him, what was important was physical chemistry. He would not have an interest in the applications and chemical engineering. Latimer was different; he did. Now, at the same time, the College of Engineering didn't have chemical engineering and started something called process engineering. That had its own faculty. The two lived in competition until, I think, the early fifties. It was not a happy competition.

You have to realize there are two other unusual things about Berkeley. One is that the existence of a separate College of Chemistry is a Berkeley oddity. You don't find other separate colleges of chemistry. Chemistry is in liberal arts. At Berkeley, it's a separate college. People always ask why, and the answer is, like everything else, it was a separate college back at the founding of the university in 1868 and the [eighteen] seventies. It was actually a College of Agriculture and Chemistry as it started off. Those then split into two colleges. I think the short story is that the point in time in the early 1900s when there would be a reorganization that should have captured chemistry into the College of Letters and Science, G. N. Lewis was there and very strong in wanting to keep the college separate. It's very hard to find another college of chemistry, [but] I have found one. It's at Lund University in Sweden, but that's the only one I've found.

Now, where should chemical engineering be? The answer around most of the world and most of the United States is in engineering, rather than located near chemistry. There are three places in the U.S. where the organization has been with chemistry instead. One is Berkeley. Another is Cal Tech, where there's a Division of Chemistry and Chemical Engineering. The third is Illinois, where there was a School of Chemical Sciences until they reorganized recently. To put chemical engineering with chemistry rather than the rest of engineering is unusual and is something that happened at Berkeley. There was sort of a war of attrition between engineering and chemistry on this in the early years. The story, as I understand it, is that [Robert Gordon] Sproul and [Monroe] Deutsch, who was the provost of Sproul, set up an adjudication committee of three people, which included, one, probably Wilke from chemical engineering, two from engineering, but one of those was Earl Parker of material science and engineering. As that committee functioned, with the question of what should we do in this area rather than have two competing programs, Parker is reputedly the one who cast the swing vote to say that chemical engineering should be with the College of Chemistry because it would do better there. Back to—

07-00:26:34

Rubens:

What date are we talking about when that happened?

07-00:26:37

King:

Early fifties. There is actually a set of graduate students, a sequence of graduate students of sociology, who have worked on projects to document that history for chemical engineering at Berkeley. That's worth looking at. It's probably obtainable through the chair of the chem-e department. I don't think I have copies. It was an odd history, and it was a relatively new program. It was one of the things that grew greatly as the money was put into the University of California after

World War II and as we had the great wave during the Pat Brown years. Part of it was that the Irvine, San Diego, and Santa Cruz campuses were built there in the sixties. In the very late fifties and early sixties, there was a lot of building of chemical engineering. For years, there had been five faculty members. [Theodore] Vermeulen, Wilke, [Donald] Hanson, [LeRoy] Bromley, [Charles] Tobias had been the faculty. Then about 1957, John Prausnitz and Gene Petersen are going to add in to bring it to seven. Alan Foss, Simon Goren. I'm probably number ten in the hiring of this department. There were annual additions to the department. I arrived here in '63. I share an office with Simon Goren, who has come here in the fall of '62 from Johns Hopkins, and then there's also Alan Foss, who came one year before that from Delaware. A lot of us arrived at more or less the same time, as part of the building up of the department.

07-00:28:50

Redman:

Would you say that the position of chemical engineering as part of chemistry—does that have particular benefits or drawbacks?

07-00:29:02

King:

Oh, yes. That's one that's worth a three-hour discourse. I'll try to keep it down. It results in a department that uses chemistry much more than an ordinary chemical engineering department would, and there's a lot of chemistry that is very useful within chemical engineering, so that's a good thing. It also applied the standards of G. N. Lewis and his successors as these major, major, major Nobel Prize-level chemists. Those standards were used in creating and screening the initial faculty for the department. That was a very good thing. However, the costs are that the practical engineering component of the curriculum will be less, which we'll get back to the interesting charge I had about coming here. It also means that the interactions at that time with the other engineering departments were much less. So whereas there could have been very productive collaborations with electrical and mechanical, they didn't happen much. That's now changed, incidentally, hugely, particularly with the arrival of biochemical engineering.

07-00:30:32

Redman:

Is that in part due to the physical layouts of the departments? Is it because you have more face-to-face interaction as well?

07-00:30:42

King:

It's very simply that. There's an inverse square law, or an inverse cube law, of interaction. You've got to be close together to interact—at least before the internet.

07-00:30:54

Rubens:

Where and what was your building literally?

07-00:30:55

King:

Gilman Hall. Gilman Hall had been built in the mid-1910s, in connection with Lewis coming to Berkeley. There's another interesting story there, too. When Gilman Hall was first built, it was the chemistry building. It is now a registered national historic landmark because plutonium was isolated in room 307 by [Glenn] Seaborg and co-workers. Very symbolic building. It occasionally gets announced as a hot building, because the early workers with plutonium didn't contain it all that well. It had, just before I came to Berkeley, been converted to chemical engineering. It was given to the chemical engineers so they would have offices together and occupy the whole building. Their size had become that. In that sense, it was the chemical engineering building from there forward. Very interesting early stories. Wilke and Vermeulen used to tell stories about when they all shared offices. The early department was all on the second floor of Gilman Hall. There was a chemistry office down at the end of the hall, on the south side. That's where the telephone was. The telephone was not in their room. They, however, had a buzzer. One buzz meant Wilke, two buzzes meant Vermeulen, and they were supposed to run down and use the telephone there in the main room at the south end of the second floor. It started off that way. A very early entrepreneurial effort.

Let me stick in the story about G. N. Lewis coming to Berkeley. There's a tie with MIT there. Right around the turn of the century, just past it, at MIT there was a great contention as to what role and what future MIT would have, and would it be more practical and related to industry, or would it be more research-oriented? The three actors in that were William H. Walker, who was a founder of chemical engineering at MIT, G. N. Lewis, and A. A. Noyes. Walker eventually won out, and MIT went practical and had a research laboratory of industrial chemistry, which is the thing that Walker had started. Noyes and Lewis went off to do other things. Noyes is the original, real founder of Cal Tech as we know it today. Lewis developed the College of Chemistry at Berkeley into what it is.

07-00:33:56

Rubens:

Where had chemistry relocated?

07-00:34:05

King:

Latimer [Hall] had just been built. Its dedication ceremony was a week or two after I arrived. That's a great big building of eight stories above ground and two below. Chemistry had moved from Gilman and Lewis Halls into Latimer, and then as of 1964, Hildebrand Hall [opened], which was built for chemistry. The chemistry library had moved out of Gilman Hall, where it was on the south end of the first floor, to the ground floor of Hildebrand Hall, where it is today.

07-00:34:45

Rubens:

And engineering was at Cory?

07-00:34:49

King:

Yes, and McLaughlin, and O'Brien, and Davis Halls, and the Hearst Mining Building.

07-00:35:04

Redman:

The department was fairly new, but what was its reputation among the larger field of chemical engineering?

07-00:35:11

King:

It had a very good reputation. I think this reflects the standards of the chemists and the people who were hired as a result of that. That first survey of the rankings of departments in the U.S. that was done by the National Research Council [NRC], shortly after I got here—I want to say something like 1966, but I'm not sure of the date—it had the Berkeley chemical engineering department ranked high. Something like number three or four. The birth out of this stellar, high reputation college and department of chemistry I think had a lot to do with that. This was just not your ordinary startup chemical engineering department. It was something with very noble parentage.

07-00:36:05

Redman:

Did you, at this time, as a new faculty member, have much interaction yourself or knowledge of the department's interaction with other organizational levels of the university, like the chancellor's office or anything?

07-00:36:18

King:

I had rather little knowledge at the beginning. However, my administrative career is that, in 1967, which is only four years later, I become a vice chair of the department. I think it was '65 that I started doing graduate admissions for the department. As of doing graduate admissions, I of course interact with the graduate division. I would describe it this way. I think my world was chemical engineering and that department, which was a very cohesive department. The founders all got [along] together beautifully. Everyone got together beautifully. There were senior people who cared about you a lot. Wilke would talk with me repeatedly about what I was doing and what I wanted to do and so forth. So did Hanson. So did John Prausnitz, who was not that many years ahead of me. It was extremely cohesive and very family-like. I do believe—and this is not a comment on the chem-e department so much as it is on everything within the university—I do believe that that sort of thing has changed over the years. With the arrival of federally sponsored research big time, and major laboratories, and natural associations with people who have similar interests to you at other universities, all of that has served to lessen the cohesiveness of the departments. It's a harder thing nowadays to bring

the department together in the way that was so easy back when I first got here.

07-00:38:04

Redman:

Did you carry with you that same sense of awe in this department as you described that you had as a young faculty member at MIT?

07-00:38:14

King:

Yes. It was a different sense of awe. Wilke, Vermeulen, et cetera, had very good reputations, but they hadn't written the books on which I cut my teeth, which was the case at MIT. However, I knew very well in agreeing to come here that the chemistry department was a national treasure, and had immensely respected people in it, and had Nobel Prize winners. Jeanne, who was herself a chemistry major, as I mentioned back there, remembers going to a lecture in 110 Strathcona Hall at Yale. It was given by the great Glenn Seaborg, who had discovered new elements and all sorts of very impressive things. My gosh, here he was. It wasn't too long before we were sitting right across the table from Glenn and Helen Seaborg at a dinner, trying to figure out what you'd talk with them about.

So the chemists were exceedingly impressive. I had done my dissertation on this mass transfer subject, having to do with packed columns, which are this big equivalent in the oil refinery, where you contact a gas and a liquid and do a separation process. Here I am trying to make an impression on big time—big time—chemists with that kind of research. I was a bit wary of that, and leery of it. The college did have a tradition, which was originated by G.N. Lewis and which was still continuing full-force at that time, of a weekly colloquium, where there would be somebody talking to the entire college. That isn't done nowadays because the sub-fields are so split apart. There's an organic chemistry seminar. There's a physical chemistry seminar. There's a chemical engineering seminar, et cetera. No college-wide seminar. They did this for all new faculty members. I was, early on, presenting my doctor's work to all these chemists in the big lecture room in Lewis Hall. 110 [Lewis], is it? Anyhow, the one to the south side of Lewis Hall. It's an enormous auditorium. That was awe-inspiring, to answer your question.

07-00:40:43

Redman:

Awe, fear.

07-00:40:44

Rubens:

Why were you saying that you were wary about the presentation of your science to these people?

07-00:40:51

King:

Because it's engineering, which isn't science. They are such people of enormous reputation and stature, and the field is so different from their own. My concern is how do I convey the intellectual appeal and importance of all of this to them? That to me was not straightforward. I seem to have done it well enough, but it was a real challenge.

07-00:41:23

Redman:

I was just going to ask, how did you feel after?

07-00:41:27

King:

After the seminar? I was okay after the seminar. Among these very impressive chemistry figures, there were some who took particular interest in chemical engineering and wanted to make it all work and had the wherewithal of participating intellectually in conversations. I would include in that class Bob Connick, who was the dean when I got here, Ken Pitzer, and Melvin Calvin.

07-00:42:06

Redman:

Would you say that any of those figures, or anyone else, were mentors of sort from the chemistry department? Did you have a mentor in the chemistry department?

07-00:42:14

King:

No, I don't think I had mentors in the chemistry department. Wilke was certainly a mentor, and Sherwood, when he gets to Berkeley, of course becomes a mentor.

07-00:42:28

Redman:

You said that you shared an office. What other space, what other facilities, were you either given or given access to as a new faculty member?

07-00:42:38

King:

I had access to a laboratory in the beginning. I was given a piece of room 121 Gilman, a lab bench, to start out with. Then, within a year or so, once Lewis Hall had been rearranged and vacated, I got room 311 Lewis Hall, which is an L-shaped thing that the elevator takes a portion out of. My startup package, I remember quite well. It was, one, used gas chromatograph. There was another, however, very important part to the startup package. It was the opportunity to support some students through the Lawrence Berkeley Laboratory [LBL]. The situation there was that there was the nuclear chemistry division of LBL. The head of that was Isadore Perlman. It was, of course, the division in which Seaborg had done his work with the heavy elements, so a very distinguished division. The College of Chemistry had made this decision to start up chemical engineering and take good care of it. Have it be there rather than in engineering. Incidentally, in hindsight, I think another reason for that may have been—and I don't know this

for a fact at all; it's just an educated guess on my part—another component of that may have been to keep the college independent as a college rather than have a one-department college be absorbed into L&S [Letters and Sciences]. By having chemical engineering—now you've got two departments.

Anyhow, a very small percentage of the budget of the nuclear chemistry division of LBL was given to Wilke to use as he saw fit for start up with new faculty. I would have two students at a time up in LBL. Subject matter left to my own choosing. I'd have to say to Wilke what I wanted to do, and I suppose he had the opportunity, if he wished, to say, this is ridiculous, don't do it. But he didn't. He was encouraging. So that was another very important part of the original startup. It was the opportunity to support some students and use equipment and apparatus that existed within LBL. I also had one student whom I co-supervised with Wilke. That was a way to get going before I got into the business of getting my own research grants. That's something I want to talk about, too, but that's a little later.

07-00:45:22  
Redman:

You had mentioned that you had explored nuclear engineering at MIT and weren't that interested. Did that change when you—

07-00:45:37  
King:

Here's another result of being in the College of Chemistry. Nuclear engineering did exist at Berkeley when I came here. It was a relatively new program within the College of Engineering. Tom Pigford, who had been at MIT, had come to Berkeley and had started that program. But it was over there. It was pretty clear that my future lay with chemical engineering, and what sort of splash I could make in it would be appreciated by the College of Chemistry people. It was pretty clear that it didn't make a lot of sense to pursue nuclear things.

07-00:46:16  
Redman:

At LBL, were you involved in nuclear chemistry there?

07-00:46:22  
King:

No. That was the division that administratively housed the research, but it wasn't nuclear chemistry research. It was more mass transfer. Still extending on things that had been suggested by what went on in my doctor's dissertation. That will change when we get to the Department of Agriculture.

07-00:46:49  
Redman:

The students that you were working with at LBL, these were doctoral students that you were—

07-00:46:54  
King:

They were chemical engineering graduate students.



07-00:46:59

Redman:

Were you their advisor?

07-00:47:03

King:

Yes. I was their research director, so-called. My first doctorate student was Charlie Byers, and that was a project done through Lawrence Berkeley National Lab. My first master's students were Ed Hausman and Alan Kosinski, and theirs were both projects done through the Lawrence Berkeley Lab. The one I co-directed with Wilke was John Heuss. Wilke had the nice feature of, if something was co-directed, I got to do it.

07-00:47:40

Redman:

Was it generally common that new, first-year faculty members advised doctoral students?

07-00:47:46

King:

Yes.

07-00:47:50

Redman:

Were you conducting research at LBL?

07-00:47:55

King:

All the research I have ever done past my doctor's thesis is done with and through graduate students. I did not have research of my own. My research was always [with] graduate students. There are several reasons for that. Going back to what I think I described to you about the quantitative analysis lab at Yale, where a left-hander pulls out the stop cog and the sulfuric acid spills all over the place, I'm not particularly deft in the laboratory, but I'm real good at working with people to think up good things to do in the laboratory.

07-00:48:34

Redman:

Did you also work with other faculty members at LBL or was it really just the students?

07-00:48:38

King:

I had some collaborative work with other faculty members. I mentioned that with Wilke, which was a project on mass transfer in froth flows. I, early on, had some work collaborative with Alan Foss on process simulation. This now goes back to the charge that I had mentioned earlier that I was given upon coming to the department, which is that I should find a way to work with Foss and others to create a program in the practical or design or process end of chemical engineering, this being what's most vulnerable within a college of chemistry because it's the least related. Early on, I did another thing, which is very much teaching, which was to get into the use of case problems, inspired by the idea of what I'd done with Sherwood at MIT, and having at my disposal some of these fifty-two projects from my four semesters of Practice School. I started a course that involved

teaching with case problems. It started at the graduate level, was a very popular graduate course, and within a year or two, we had a senior year elective version of it that was a separate course.

07-00:50:12

Redman:

When you say that you were charged with doing this, was it by Berkeley faculty members?

07-00:50:18

King:

Charlie Wilke told me this—what the department wanted me to try to do.

07-00:50:24

Redman:

Were there any voices, either in the chemical engineering department or in the college of chemistry, that didn't want chemical engineering to go this route?

07-00:50:39

King:

You should wonder about that. I can't speak for the chemists. I don't know. There probably were some that wanted it kept more like chemistry, but if so, I didn't know of it. There's another thing. If you're in some department and you have particular interests, and there were certainly people in the chemical engineering department who had quite fundamental, not very applied interests, and yet you know that your discipline should contain an applied element, it's just fine to have somebody else do it. So there was that element.

07-00:51:24

Redman:

You've mentioned a lot the importance of and your own interest in using case studies and using these case problems. Did you already appreciate the pedagogical benefits of that or was that something that, over the course of your career here, in developing this program, you started to really grasp?

07-00:51:52

King:

I thought I knew how to do it, and I knew how to do it because of co-teaching a course also, a second course, one semester with Sherwood, using those cases, and in particular, using my own multi-effect evaporation case. I thought of it as a very good way to bring up principles and show their immediate application as you bring them up. Hitch them to something, hook them [on] to something. It seemed to work. Again, you have to be steps ahead of the students. If you throw a problem at a class of students, then hands raised with ideas as to how to go about solving it, which is how we would do this. You're liable to get almost anything, so you've got to be able to answer it and deal with it. That seemed to work for me.

07-00:52:56

Redman:

In these early classes, did you use Sherwood's book as a textbook or did you use it as a reference—

07-00:53:02

King:

For the case problems, I actually wrote individual case problems that I used myself. I would hand them out to the class just as the problem so that they would not have a solution to look at, and because I wanted them to be considering all aspects of the problem. We did eventually publish a compendium of case problems through my earliest work with the American Institute of Chemical Engineers [AIChE]. I—and it became we soon thereafter—joined forces with a guy named Don Woods at McMaster University in Canada. He had done similar things. When I said it became we, Scott Lynn was hired about two years after me. Maybe a little more. Maybe it was '67. He is somebody who had had a significant industrial career of ten or twelve years at Dow Chemical out here in Pittsburg, California, before he came back to the teaching post at Berkeley. He, of course, had these practical interests, too, so he and I started working together on these things.

We also had what you can call troubleshooting problems, and Don Woods had these, too. A troubleshooting problem is, here's this piece of equipment. It's supposed to be doing this. Oh my gosh, this thing is wrong with it. Here are the symptoms. How do you fix it? You're supposed to do deductive reasoning from the symptoms and what changes the occurrence of one of these malfunctions would make to the process and its outputs.

07-00:54:42

Redman:

Forgive me, this might be a silly question. Throughout all of your time of using these case problems, did you ever give students problems that hadn't been solved?

07-00:55:07

King:

Not for the troubleshooting problems, because it's pretty hard to cook one of those up out of whole cloth. You need to have experienced it and met the problem and gone through the reasoning. Yes, I think there were some that really hadn't been solved yet and were newly cooked up for the occasion. We did do that. You have the greatest comfort level doing something you've already lived with and can utilize. I remember one that had to do with the malfunction of the refinery air drier at Bayway. They had to have dry air for all sorts of process purposes. The air dryer wasn't working right and it had these symptoms. That was a delight to turn into a case problem. I was more comfortable doing that, but I don't think we limited ourselves to that sort of thing.

07-00:55:59

Rubens:

Did you have undergraduate students or were these case—

07-00:56:05

King:

Yes. It was a senior year elective that I might get a fifth of the graduating class to take. It was both a graduate course that would draw the large majority of the incoming graduate students, which was very satisfying—that was Chemical Engineering 265—and then there was Chemical Engineering 165, which was the senior elective. You have to run the two differently, because graduate students know more. If the graduate students and the undergrads were together in the same class, the undergrads would be mute.

07-00:56:45

Rubens:

So undergraduates could major in chemical engineering.

07-00:56:52

King:

These were all majors in chemical engineering.

07-00:56:55

Redman:

How many about were in the graduate program?

07-00:57:03

King:

I remember very well the size of an incoming graduate class in those days, because I had been doing it [graduate admissions] for a few years. The answer to that was around fifty in the incoming class. It is much less now, by the way, and that's because we allowed a plan for terminal master's [degrees] back in the old days, and they do not now. That was the size of the incoming graduate class. It was about half and half master's and PhD. The undergraduate class now numbers over a hundred. I do not believe it was that large in my day. The classes were smaller yet, because every course was given every semester or quarter—or semester. I've been through both those changes [semesters to quarters, and quarters to semesters]. The typical class size sitting in my room might be about twenty for any course.

## Interview 4: May 16, 2011

## Audio File 8

08-00:00:01

Redman: During our last interview, we talked about your last years at MIT and got into your first year at Berkeley. Before we move on from there, I'd like to get started with a few additional questions. First, you have spoken a lot about Dr. Wilke. Could you tell us a bit more about him in terms of research interests, outside interests? Really anything that strikes you.

08-00:00:38

King: Sure. Charles Wilke was one of the few founders of chemical engineering at Berkeley. He was, for most intents and purposes, the first chair of the department, although I believe Ted Vermeulen held that title for maybe a year before Charlie. Charlie's research expertise was mass transfer and diffusion and such things. He had a very high standing in that in his early years. There are a couple of very interesting things about him. One is that just before I became department chair—this would be late sixties—he made the decision to convert his research totally. The new field would be biochemical engineering, which is now a very large field, and very populated. But in those days, there was practically nobody. So he recognized an opportunity there and he decided to pursue that opportunity. He withdrew from research for something like two or three years to learn this new field—goodness knows what happened to his merit increases during that time—and then started doing research in biochemical engineering, and in that sense was the founder of biochemical engineering in the department.

Charlie also had a sideline activity, which was very small at the beginning, and which actually became so large that he left the department before normal retirement age. He would manage people's investment portfolios. He turned out to be very successful at that. I think he had done some things like small retirement funds or group activities of one kind or another, and became so successful that he cut himself back to half time at one point, and the other half time was devoted to the business, and then retired earlier than I think he would have otherwise, and had two offices. One in Berkeley and one in Orinda, managing portfolios. A man of many interests.

08-00:02:59

Rubens: Just liked it or had a facility for it?

08-00:03:02

King: He passed away a few years ago.

08-00:03:03

Rubens:

But his investment—he just had a facility for it?

08-00:03:07

King:

Yes. The unique thing he had on this is that he wrote computer programs that would analyze the market. This was before such things existed anywhere. By the ability to calculate very elaborate things, he had a jump ahead of everybody else with regard to portfolio management. That's what he did.

08-00:03:34

Rubens:

He wasn't doing it for the university, for the Berkeley Foundation, or—

08-00:03:40

King:

No, he never did it for the university. That's probably a conflict of interest. It was for independent entities.

08-00:03:50

Redman:

One of the next questions I wanted to ask you was to what extent the chemical engineering faculty were involved in industry and other external work. We should probably focus here not on investment portfolios. You'll probably talk a little bit about this when you are discussing your own consulting, but how common was it at the time for faculty to be involved outside of the university?

08-00:04:21

King:

I believe that maybe half of the small faculty at that time had consulting activities, which might typically be a total of something like six days a year or something like that. Small consulting activities by today's standards. There are the thirty-nine days that are allowed now by the policy of the academic personnel manual, and I don't think it was up to that. However, as we get later on, some of the early formation of outside companies came out of the chemical engineering department, so there was that.

08-00:05:01

Redman:

You just mentioned this thirty-nine day policy. When did that go into effect, do you know?

08-00:05:07

King:

Yes. It went into effect during my time as provost of the university system. I remember coordinating the review process on it. It was understood. If anybody asked, the answer would be, oh, a day a week. Of course, thirty-nine days a year is a day a week for the thirty-nine weeks of the academic year. There was a Regents' rule, number something or other, which said that outside activity was allowed and even encouraged, so long as it did not occur to the detriment of your performance of your primary duties at the university. Well, that was not very quantitative. There was a feeling that developed during the

eighties that we needed to make that more quantitative, and it happened that that process converged on me during my years as provost for the system.

08-00:06:08

Redman: That's interesting to me. Was there any sense among the faculty of disliking this new policy?

08-00:06:19

King: When it came in?

08-00:06:21

Rubens: That's about 1997 or 1999, I think I read.

08-00:06:23

King: Yes. Well, there probably were people who felt that it was a burden or it was not written liberally enough, but generally it was quite well accepted when it came. It comports with what nearly all other universities do.

08-00:06:43

Redman: As we're sort of cleaning up from last week, we talked a bit about Jeanne's role and your family here. I'm curious whether she would sort of fit the definition of a faculty wife at the time. If she had a role on campus as well as your wife. If that was something that Berkeley had.

08-00:07:04

King: No. Other than the employment that Jeanne had before our first child came, she never had employment of a paid variety thereafter. She's had much volunteer work, and that has been largely outside the university. There were things that involved spouses within the university in those years, and which have actually petered off some in recent years. Believe it or not, the College of Chemistry had a monthly tea for faculty wives. I actually raised this question to Jeanne of whether it was for faculty spouses or faculty wives, as that became something that could be answered different ways. No, it was very definitely faculty wives.

08-00:07:51

Rubens: Who organized that?

08-00:07:53

King: The dean's spouse would organize these. That went on through Jeanne, and I think with Penny Moore—Brad Moore succeeded me as dean. I think it trickled off after Moore's deanship. There was another form of involvement that was quite active in those days, called the Section Club. There was a Newcomers part of the Section Club. We have lots of friends who were in Newcomers at the time.

08-00:08:33  
Redman:

What is the Section Club?

08-00:08:34  
King:

Oh, the Section Club is an organization of—now I have to be careful again whether it is faculty spouses or faculty wives.

08-00:08:42  
Rubens:

Faculty wives, I think is how they identified members.

08-00:08:44  
King:

I think this one is still that, although it wouldn't surprise me if a man showed up every so often. It has many, many different committees within it. One thing it's done a lot of is tend to International House. They do a number of things for International House. They had a program of finding residences, out in the homes of the neighborhood accommodations for foreign students who weren't in the International House. That was another thing they would do, and several other charitably oriented activities. That was a large activity in those days. That actually remains quite a significant activity at the Berkeley campus.

08-00:09:30  
Redman:

Was Jeanne involved with—

08-00:09:32  
King:

Yes, she has been involved with the Section Club. Not at the very beginning, but she was involved with taking part in and helping with the chemistry faculty wives' teas back in those days. Other than that, she's been a user of Cal recreational facilities for exercise classes, and then a zillion different events in connection with the various capacities I've had, as the spouse at my side.

08-00:10:09  
Redman:

What about you as a family? You said that when you came to California, you didn't know anyone. Was your social life built around the university?

08-00:10:19  
King:

Our social life was built around the university, particularly the first year, when we lived on Hilgard Avenue, close to campus. The best friends were the other new faculty in chemical engineering, and to a lesser extent, in chemistry. Through Newcomers, we participated in some other things. I can remember an evening event at the home of Ed and Sandra Epstein, who were in our class as newcomers but were not College of Chemistry. He was business school. The social life in the early years was almost totally the university. It was after we moved to Kensington in 1964 that we got into more and more Kensington-related things and activities and social life.



08-00:11:17

Redman:

I would like to jump back to LBL for a bit. I'm curious as to how many other chemical engineering faculty were also spending time at LBL.

08-00:11:39

King:

Well, I believe that Charlie Wilke, Ted Vermeulen, Don Hanson, all of whom were the founding faculty of the department, had those involvements through the nuclear chemistry division. There was also something called IMRD, Inorganic Materials Research Division—that's what it was—that Charles Tobias was involved in. His activities were electrochemical engineering, and related to materials. In my generation of faculty, I had support up there. I think Simon Goren may have had a student or two supported through the Lawrence Berkeley Laboratory. It was early in those years, and I'm going to guess around 1966 or '67, that the chemical engineering program, per se, phased out within the nuclear chemistry division. The involvement of chemical engineering in LBL took a holiday for a few years and then started coming back strongly in a different way in the early 1970s as the energy and environment division was started.

08-00:13:09

Redman:

You said that a student or two was supported through the lab. That made me realize I hadn't talked to you about how students were supported. You were advising these students and their funding was coming from?

08-00:13:25

King:

Largely from research assistantships. There would be three forms of financial support for the students. There could be a teaching assistant. In those days, a graduate student might be a teaching assistant for one or two semesters total. The department just didn't have that many teaching assistantships. Research assistantships would be from a government grant or through the Lawrence Berkeley Lab, and thereby associated with the research the student did. Then there were fellowships, like the National Science Foundation Fellowship, or a foreign fellowship. An example of one of my students back in the late sixties and early seventies was one who was supported all the way by Conacyt, of Mexico—an acronym—which provided him full fellowship all the way through the Ph.D. That was Paco Barnés who later became Rector of UNAM, National Autonomous University of Mexico.

08-00:14:34

Redman:

Were these sources of funding from Lawrence Berkeley competitive? I'm sure they were competitive to some extent. How competitive were they?

08-00:14:46

King:

Through the Lawrence Berkeley Lab? At that point in time, the Lawrence Berkeley Lab was primarily funded by the Atomic Energy Commission. This was before we went to ERDA [Energy Research and Development Administration] and the Department of Energy. The funding did come from the Atomic Energy Commission. It was programmatically related, but the chemical engineering portion was either a very loosely-defined pot of money for chemical engineering, or possibly out of Is Perlman's discretionary funds, if he had any. I don't know which it was. It was a very wide berth as to what the research could be. It was not pre-defining or constraining with regard to the research, except we liked to have it be mass transfer, diffusion-related. Now, as I think back, that may be because the program was built with Charlie Wilke as the principal investigator and it was defined to relate to his original interests.

08-00:15:58

Redman:

Were you aware of the breadth of research? Were you given access? Could you know about all the research that was going on in that lab or was it so compartmentalized that wouldn't even really be a consideration?

08-00:16:17

King:

With the lab being up on the hill, and with the exception of one of my students, all of the students doing research, being down on the campus, in space that was assigned for LBL purposes, we would all stay on campus. There was no particular incentive to go to seminars up the hill. The one way I got up the hill was in my first summer here, when I was doing a piece of research that involved the digital computer—a very early form of the digital computer—and I would climb the Seaborg steps, or drive up, and I would have my stack of IBM cards in my hand. I would submit them. They would be run through the computer at some time in the next twenty-four hours. Then you would go up and find that you had some bug in your program, and you'd better fix that. You went through this finding bugs, debugging, et cetera, for maybe fifteen or twenty sequential trials, and then eventually it ran and you had your answer. I have a paper that was based on that, one of my early papers. That's the one way I got up to the lab itself. The other exception was one student, John Heuss, who was joint with me and Wilke, and his equipment was up in building seventy, I think it was, of LBL. He was up there and I would go up there to meet with him and talk with him. Sometimes he would come to campus. Integration with the rest of LBL—no, not much.

08-00:17:51

Redman:

At that time, before it was LBL—I shouldn't be calling it that—was there such a thing as security clearance to get up there?

08-00:18:03

King:

I never had a security clearance for LBL. At some point, that I think is early in my time with the university, it actually withdrew totally from classified research. That was associated with [Lawrence] Livermore [National Laboratory] having been formed, and anything that would have been classified having gone to Livermore. I never had a clearance through LBL. I did have a clearance when I was at Oak Ridge as a student. A "Q" clearance.

08-00:18:31

Redman:

I was just going to ask you if there are any useful comparisons. You spent a lot of time at the two major national labs. Are there useful comparisons between Lawrence Berkeley and Oak Ridge?

08-00:18:48

King:

Between Lawrence Berkeley and Los Alamos and Livermore?

08-00:18:51

Redman:

Well, certainly if you could speak to that, but I was asking about Oak Ridge and Lawrence Berkeley.

08-00:18:56

King:

Oh, with Oak Ridge. Those were similar types of labs in that they were more basic research, the Oak Ridge National Lab and the Lawrence Berkeley National Lab. The great difference, of course, was that the Lawrence Berkeley National Lab grew out of the Berkeley campus and was started by Lawrence, who was Berkeley faculty, and other very prominent early people, like Perlman, like Seaborg came out of the Berkeley faculty, so the intellectual weight of the Lawrence Berkeley National Lab came very heavily from the fact that the lab was so close to the Berkeley campus and people had dual appointments. Oak Ridge was by itself. It has never had that close a relationship with the University of Tennessee. Yes, it has a relationship back and forth with the University of Tennessee, but not this tight. In that sense, LBL had the hallmarks of a national lab that is sitting right next to a very well-esteemed university, and a lot going on back and forth, whereas Oak Ridge was more self-contained. The World War II origins of both differ. Lawrence Berkeley really did not have large-scale Manhattan Project work, even though Lawrence was an early pilot of the Manhattan Project. Oak Ridge, of course, had grown completely out of the Manhattan Project. The first thing to be built at Oak Ridge was Y-12, with thermal diffusion separations, and the calutrons, which we talked about earlier, and then also K-25, which was the gaseous diffusion plant for very large-scale enrichment of uranium.

08-00:21:00

Redman:

This probably is a question that will span your whole time at Berkeley, but perhaps not. What was the community's response, or the city of Berkeley's response, to having this lab be part of their town? Was

there a sense of importance? Was there a sense of threat? Was there a sense of too much government?

08-00:21:25

King:

There were concerns, but given the nature of the city of Berkeley, I think those concerns have been less than what one might expect if one just simply went into the situation cold. I've always related that fact to the fact that here is the Lawrence Berkeley National Lab, and here is the city of Berkeley, and in between is the campus. If something is going to be done, it's taken out more on the campus than on the National Lab, which is interesting. Yes, there has been concern about the National Lab, and particularly when it was associated with nuclear weapons. An example of that is the group that held vigils for many years, and still holds vigils, on the western end of the Berkeley campus, where the semicircle is, facing University Hall, which is where the system-wide administration was. That is protest against the management of Livermore and Los Alamos. That was going on as early as I can remember and has continued. Interestingly, when the Office of the President [OP] moved to Oakland, the vigils remained where they are. One occasionally sees them still. That's sort of quiet protester action, I would say. But it has always surprised me that there has not been a greater array of concerns from within the community of the city of Berkeley on [directed at] the Lawrence Berkeley National Lab. I think in part, this is because so much of the work is either very fundamental or very peacetime-oriented. The Manhattan Project work, and what came as a natural follow-up to the Manhattan Project, actually moved out of there as of the formation of Livermore, which was, I think, 1952.

08-00:23:40

Redman:

Do you think that a component of that is this lab has been around since far before World War II?

08-00:23:49

King:

Yes. This was not a lab whose existence is due to the Manhattan Project. It is a lab that had some participation in the Manhattan Project, but the start of the lab is in the thirties and is Lawrence's second generation or third generation cyclotron, when they got big enough so they didn't fit on campus

08-00:24:21

Redman:

We just talked about the reputation within the city of Berkeley, but what about the reputation within chemical engineering? Lawrence Berkeley Lab is not a chemical engineering lab. Was there still a level of prestige? Would people know outside of Berkeley that important work was going on there? That this offered a new, important resource?

08-00:24:44

King:

I'm not sure I'm answering the question the way you want it, but I think the fact that our research would carry the byline of authors and then Lawrence Berkeley National Lab and Department of Chemical Engineering, University of California—I don't think the fact that that said Lawrence Berkeley Laboratory added in any substantial way to the prestige or recognition of the papers. The world of chemical engineering is what it is. As you said, the Lawrence Berkeley Laboratory was a different creature, thought of in terms of physicists and chemists. In that sense, it was almost immaterial within the chemical engineering world that the lab was the point of origin. However, turned around and looked at the other way, I can assure you that the chemical engineers in the chemical engineering department were very grateful to have their small fraction of the nuclear chemistry budget from the lab.

08-00:25:43

Redman:

You had said that the students worked on campus, in space designated for the lab work. Was this also in Gilman? Where was the space?

08-00:25:55

King:

Well, it depended on where the work was. There was some in physics as well. I will know the answer with regard to the College of Chemistry, and the answer is kind of scattered throughout the College of Chemistry. Yes, Gilman. Yes, Lewis Hall. As the biochemical work came along, Latimer Hall. This became particularly interesting in later years. There was the time when the Secretary of Energy was Admiral James Watkins. He was very concerned about proper management of safety and environmental issues within labs. He created what were known as Tiger Teams. When the Tiger Teams were formed and the Lawrence Berkeley National Lab Tiger Team came, the fact that they had used and made formal payment for this space on campus became important, because the ruling was also made that if there is LBL space in any building, the entire building was subject to inspection by the Tiger Team. This is looking way ahead, but there was the time when I was dean of the College of Chemistry and we had about two months warning that we were going to have Tiger Teams all over the place in the buildings of the College of Chemistry. They were indeed "tiger" teams. This was tough stuff that those inspectors came up with. That's far down the road. It's an interesting result of the use of campus space for LBL work.

08-00:27:32

Redman:

Do you know what were the terms of the contract of that? I'm just curious whether Lawrence Berkeley Lab paid the university. I get that they're connected.

08-00:27:51

King:

I don't know the answer for those days. I, of course, do know the answer for later days. The land on which the laboratory sits is University of California land. It is owned by the University of California. With regard to the contract, the university is paid an amount for the management of the labs, which, in my day, was a fee much smaller than would be paid to a lab manager such as Battelle or an industrial corporation. The university's position had been that the fee was not the important thing; the public service was the important thing. This applies to my time as provost at the Office of the President. The fee was used in large measure to be returned to research. There was something called UCDRD, University of California Directors Research and Development Funds, that would be returned by us to the laboratory director. The laboratory director would then use it to seed new projects in areas where there wasn't line-program support from the Department of Energy. The fee has always been, in that sense, invested back into the lab, rather than used in any way that would be substantial profit by the university. There was something called Nuclear Science Funds, which was a discretionary fund at the level of the Office of the President. This is once the administration of LBL went to the Office of the President. The Nuclear Science Funds was a fund that could be drawn on for special projects. So, for example, the University of California Press had a grant of a certain amount of Nuclear Science Funds as an endowment, back early in the days of David Gardner.

There is an interesting story related to why the Lawrence Berkeley Lab now reports to the Office of the President. It originally, of course, reported to the chancellor of the Berkeley campus and was formed out of the Berkeley campus. I believe it was the late sixties that Ed McMillan was the director of the lab and became very concerned with agitation of one type or another. In fact, it may have been the early days of Charlie Schwartz, with whom I just spent an hour before this [interview]. Schwartz was one of the early protesters about lab activities and its relationship to the campus. McMillan's solution was to request that the reporting relationship be to the Office of the President rather than to the campus. At that point, it moved to the Office of the President, and Livermore and Los Alamos moved to the Office of the President, taking the Berkeley chancellor out of the picture with regard to the administration of the lab. We're getting off the subject, but that's significant in another way, in that the campus and the lab have often worked together, very synergistically, for recruitment of major faculty. Academic appointment comes through the campus. The research support may come largely through the lab because the person is of interest to both. That relationship became somewhat different as of the point when LBL started reporting to the

Office of the President. It has still worked very well most of the time. It's been a real asset to the Berkeley campus.

08-00:31:49

Redman:

I can certainly see how there would be a great reciprocity between the two areas, I suppose I should say. I'm also curious about still this concept of having space on campus. Space on campus is a valuable commodity. Even though they're associated with UC, is there an animosity sort of bringing these outsiders with a bunch of lab space on the hill onto campus?

08-00:32:23

King:

Well, I can only give the answer for the College of Chemistry, because that's the answer I know. There, I think in general, the college has been very appreciative of the opportunity to get research support through the Lawrence Berkeley National Lab. In its assignment of space to faculty, the college makes no distinction between people who are associated with LBL or people who are not associated with LBL. Space is space. It gets allocated as it gets allocated. The faculty member decides where they will put their students. If they've got students who are supported through the Lawrence Berkeley National Lab, then the room of that faculty member, where that faculty member puts the student, becomes LBL space. The way it was done, a tally was taken of that every year. A bill was presented by the campus to the Lawrence Berkeley Lab for the rental of that space, and so the money would come to the campus. It was not distributed further down the units. In that sense, there was no resentment at all on the part of campus people. You were delighted to have the research support. You're delighted, if you're the chancellor, to have the rent. It all works fine.

08-00:33:44

Redman:

Who was the director of the lab when you first got here?

08-00:33:49

King:

I think it was Ed McMillan when I first got here in 1963. McMillan may even be the one who directly succeeded Lawrence. I'm not sure of that. But it was Ed McMillan. After Ed McMillan, I believe the next director was Andy Sessler, who was the first director who was not a Berkeley faculty member. Then, following him, it would be David Shirley, who was from the College of Chemistry. I may be leaving a person out, but I don't think so.

08-00:34:26

Redman:

Did you have any sort of relationship with any of the directors?

08-00:34:31

King:

No. Oh, no. I was an assistant professor and a peon. The highest I would connect with would be Is Perlman, who was just another chemistry faculty member.

08-00:34:45

Rubens:

Is there anything distinctive to say about Perlman as a personality or as a director of the nuclear—

08-00:34:51

King:

Well, I didn't know him all that well. I certainly found him to be a straight-up person to deal with. No problems in dealing with him. Very friendly, very helpful. I think was glad to do this, to help the development of college faculty. But I can't say that I had a lot of contact with him. I didn't. With Sessler, I started having more contact.

08-00:35:23

Redman:

Speaking of being an assistant professor, do you recall what the requirements were in terms of research and publication when you first got here?

08-00:35:40

King:

That's an interesting question. I knew that I had to have good, creative research, and that I needed to have publications of that research. Nothing was ever said to me about the quantitative number of publications. The impression and the tradition, spoken and unspoken, were that this just had to be darn good research. In fact, I've coined a description in my own mind over the years as to what was looked for in the College of Chemistry and may typify Berkeley standards. That is, we want you to do research of the nature that causes the listener or the reader to say, why didn't I think of that myself? That's wonderful. That's good research, is, why didn't I think of it myself? That's so good. So I knew I had to do that. I did have, I think, troubles picking and defining what would be world-shaking or intellect-shaking research. I was actually helped in that greatly when it changed from being a matter of my choosing projects from a world of possibilities to my being funded by a project that said pretty clearly what I was trying to do in research. My stage was set. I knew what I was working with. I knew what I had to pursue. That came when the Department of Agriculture walked into the picture.

08-00:37:40

Redman:

Which is really just the second year, is that correct?

08-00:37:43

King:

That was very early on. What happened there, there was a graduate of the chem-e department, Art Morgan, Arthur I. Morgan, Jr., whose mother had been Agnes Fay Morgan. Oh, yes. I think she was actually a professor of home economics for some years, but changed it to



nutritional science through the force of her accomplishments and personality. He was the son of Agnes Fay Morgan and he had been a student in the chem engineering department before my time. Art was head of the engineering division of the local Department of Agriculture lab. There are, I think, five regional laboratories of the Department of Agriculture around the U.S. One is the Western Regional Lab, which is on Buchanan Street in Albany.

Right behind University Village. Art was the head of the engineering division. Art came to the chemical engineering department. He wrote a little something which Wilke put around to everybody. In this little something, Art expressed a desire to sponsor some research within the chemical engineering department. The complication here was that the Department of Agriculture labs were commodity-funded. The funding is by the commodity. That is, poultry, fruit, vegetables, et cetera. Here were four areas that he could think of that were probably good ones for chemical engineering research. I've forgotten what the other three were, but one of them was something called freeze drying. Well, I knew what drying was. That involved mass transfer, which I knew and was interested in. It involved heat transfer, and I knew about that and was interested in it, too, so that might be something that would fit me. Then came into my mind that everybody's going to be vying for one of these grants from the Department of Agriculture, so I'd better come up with something good. I went to the best reference I could think of to find out what freeze drying was, the fourth item, and that was the Encyclopedia Britannica.

So I learned about freeze drying from the Encyclopedia Britannica. It was drying, but it was drying from the frozen state, and drying by what is called sublimation, where the water goes directly from the solid ice state to vapor, not liquid on the way. That serves to hold the structure of whatever you're drying. It doesn't collapse in on itself, as water would cause to happen if it were present during the drying process. I figured I could do this. Then it turned out that the commodity budget that this would come from was poultry. It became a matter of me writing a four-page proposal that was passed onto Art Morgan. That was I at the beginning. It became we later. I wrote this four-page proposal on what one might do about studying freeze drying of poultry meat, and how fast it happened, and how to avoid complications and so forth. It turned out to be the one such proposal that came in in response to Art's request to the department.

So there I was. Art was rather taken aback. Yes, this thing was pretty well-written, but it was by an assistant professor? He wanted one of the big names from the department. So along came Charlie Wilke. It was finally set up that Charlie would be the PI on this, and for the first year he was. You got these grants a year at a time. I was the co-

investigator. Then Charlie, bless his heart, adopted the posture of letting me do the entire project. Charlie would read the paper, and if he agreed with it, would sign on as a co-author, which he did on one paper, which is what he felt would discharge his obligation to Art Morgan for this role he had taken on as the prominent person in the department. That was what started me, was to have to figure out what to do as research on freeze drying of poultry meat. I had my turkeys. I think I may still have a piece of freeze-dried turkey that's now fifty years old. I gave seminars to the entire College of Chemistry faculty on freeze-dried turkey.

The point there is that the narrowing of the topic and the posing of the question, represented by the fact that this had to be freeze drying and had to be on poultry meat, was useful to me in defining good research. One other comment on that, and this I found throughout my career, another very fortunate thing for me about that project was that no other chemical engineer was working on it. Only food engineers. These were people who did not have the full panoply of chemical engineering education and capabilities. Therefore, I could immediately do things that were important and which others had not done.

08-00:43:26

Rubens:

Why turkey and not chicken?

08-00:43:29

King:

I think that may have been commodity-oriented also, and if not, it was because pieces of turkey are larger. You want to work on slabs. I would work on a slab, cut across the grain, of turkey breast meat, with the grain running the short way through this. The slab would be an inch by an inch. It's a pretty big chicken you'd have to have to do that. With turkeys, it's easier.

08-00:44:00

Redman:

You might have just answered this question, but when you were given this list of four potential topics from the USDA, clearly it was useful to focus your own thinking about how to create a good research project, but was there something about freeze drying in particular that struck you as maybe particularly fruitful for a good research project?

08-00:44:32

King:

I believe I saw from the beginning this feature of it being an area that was not populated by chemical engineers, and yet an area where chemical engineering would be exceedingly useful.

08-00:44:46

Redman:

A, why didn't I think of that, type of thing.

08-00:44:49

King:

Always when I have had students or about-to-be faculty members come to me, talking about what would be good areas of research, I've tried to get that concept in there. That you're going to be better off not being where the crowd is, but where rather few of your colleagues are, and where you can thereby have a much higher chance of making a strong, fundamental advance.

08-00:45:19

Redman:

So you were excited to embark on this project?

08-00:45:25

King:

Yes, I was. Sure. It was something that was entirely my own, except for the Wilke factor, which removed itself quickly. It was interesting, and clearly progress could be made. We did get some very good theses out of that over the first fifteen years or so of my career.

08-00:45:54

Redman:

In developing your initial research plan for this proposal, did you consult with other colleagues?

08-00:46:06

King:

Well, Wilke reviewed what I wrote up and was going to be sent into Art Morgan. That was it. No, I put it together myself. That has been my most common approach to research, is to put it together myself. There wasn't a lot of multidisciplinary research during the large bulk of my career. It would be a very unusual thing. I wasn't involved in it, other than the fact that the turkeys got very close to the area of food engineering. The technical meetings I would go to could just as likely be a food engineering meeting rather than a chemical engineering meeting. It was not a situation where I needed somebody else's expertise to formulate it.

08-00:47:08

Rubens:

Could I ask maybe a naïve question? In the food industry, this had not been—there's frozen food.

08-00:47:23

King:

Frozen foods. The history of freeze drying in the food industry is actually kind of interesting. It doesn't start in the food industry. The big push on freeze drying came from World War Two. It came with the isolation and stabilization of penicillin. This was the first way to isolate penicillin so it could be used as a medicine, and it was [also] used for blood plasma. A lot of freeze-dried blood plasma. The freeze drying stabilizes it. The penicillin would go bad if it weren't dried, and this was the one way to dry it, and ditto for the blood plasma. That was the start. Then as we came out of World War Two, it was recognized that freeze drying could have uses in the food industry. The first really large-scale use was coincidental with my career. In about 1963,

General Foods and Nestle both started on freeze-dried coffee, which became known as Maxim for General Foods and Taster's Choice for Nestle. They were heavily invested in that, and a quite large volume freeze-dried coffee industry grew up.

The other place freeze drying really made its mark in the food industry was the combination of military applications, where the military needed high-quality dried foods. Freeze-dried foods are of a higher quality, by and large. Particularly for nuclear submarines. I once had a coworker who worked with me for a year, coming up from the Naval Postgraduate School in Monterey, who was interested in freeze-dried foods for nuclear submarines. I remember very much his opening meeting with me, when he had sought me out. He comes and he says, "Well, Mr. King, you're Mr. Freeze Drying of the Western world. Could you work with me on this?" When you're approached that way, of course you work with them. So with the military use. The other one is backpacking. There are freeze-dried backpacking foods. The Army actually developed ways of compressing freeze-dried foods into a smaller volume. That, for a few years, found its way into the backpacking market, too, so as to get a smaller volume. Those are the ways freeze drying got into the food industry. Through another line, it's always been there in the pharmaceutical industry. It is the way you can dry and stabilize something if nothing else works. So it does get a lot of use for experimental products in pharmaceuticals and in the biotech industry. I had some research related to that later on.

08-00:50:36

Redman:

I want to get back to your actual research there, but at what point did you become interested in the final product? In terms of actually packaged food for hikers, was this something that, from day one, you were interested in, or was it something that, only as your research continued, you became interested in?

08-00:51:00

King:

As of 1963, I was going on backpacking trips of my own in the Sierra. This actually started before there were commercial foods on the market. I had two good friends that related to that. One was an early doctorate student, Peter Clark, who had a summer job at the Western Regional Laboratory, and who was actually one of my predecessors as Scout Master of Boy Scout Troop 100 of Kensington. He had freeze-dried food for weeklong trips in the Sierra for a group of, say, ten or twelve people. He had actually made them. This, of course, would not stand scrutiny nowadays for food safety considerations, but he had done that. We actually took along some things that had been made in this way. Then another early friend was a man named Ed Hirschberg, who started up something called E. Hirschberg Freeze Drying and Innovative Foods. He had a lot of contact with my group in the early

years. We would see each other at international conferences and such things. A company named Mountain House produced the first large-scale commercial line of freeze-dried backpacker foods. That name is still in use.

08-00:52:33

Redman:

I'm interested to hear what your initial research proposal was. What were you proposing to do?

08-00:52:41

King:

I was proposing to come up with quantitative ways of predicting and analyzing the rates of freeze drying. That was based upon a theoretical model that the rate limit is either heat transfer or diffusion through the dry layer, and there is a retreating ice core that goes more and more inward as the drying process occurs. A sharp interface between that ice core and the dried region. The rate-controlling factors are both heat transfer into the ice and mass transfer of water vapor out from the ice, through this previously dried layer of the material. We measured diffusion coefficients and thermal conductivities, so as to get the actual rate parameters, and then had research analyzing the drying of actual slabs of turkey to see if the rates did agree with what was predicted by this model, and in what ways they would depart from the model. Then we needed a fundamental interpretation of the ways in which they departed, which was some moisture being left behind, even after the ice front went. So what would be the rate at which it would come out?

Early on, perhaps in the third year of this, I added a dimension of trying to come up with process improvements for the freeze drying process. That's what Peter Clark worked with me on. We have an invention that was patented by the government. That's what happened in those days, because that was before Bayh-Dole. The Bayh-Dole Act of 1980 changed all that on patenting and ownership for universities. In those [earlier] days, the government owned the patent and the government placed it in the public domain, which meant it was available to everybody. The government could not charge a royalty for the use of the patent. You might even ask, why patent it? They would patent so as to keep somebody else from patenting it for private gain. We had a processing approach, which involved layers of food and layers of molecular sieve. You would blow a gas [at low pressure] through the food. It would be dried by the molecular sieve. In its dry state, it would sublime water out of a layer of food, then it'd hit another layer of molecular sieve, which would take the water back out, so forth, through alternating layers as you go. That concept, I know, has been used industrially in more than one place. We've worked on the processing end of it as well.

Just to finish off the line of research on freeze drying, we worked also with the phenomenon of collapse, which is about finding at what temperature will the freeze-dried material collapse in on itself and form a glob. This is very important for the pharmaceutical industry in particular. Also for the coffee manufacturers. You've got to have something that remains porous so the water can get back into it and re-hydrate it when you want to re-hydrate it, to make a cup of coffee or to re-hydrate a pharmaceutical product. You dissolve it in water. If it's just a big blob with no pores, the water can't get in there at any significant rate. You need to define the conditions that are needed to keep this glob from forming. We did research related to that and discovered that it was a matter of keeping a [sufficient] viscosity of the extremely concentrated layers of material in between the pores. Keeping that viscosity high enough so that it could not flow in the time available to it and seal off a pore. That concept, and what comes from it, has been quite useful in later years with regard to pharmaceuticals. It was helpful with regard to defining conditions under which coffee could be reliably freeze dried.

#### Audio File 9

09-00:00:30

Redman:

Regarding your initial research in freeze drying, I assume that to conduct this research, you needed new equipment.

09-00:00:53

King:

I had to build equipment, and I needed some analytical equipment. I may have mentioned already, but my startup package upon coming to Berkeley was one used gas chromatograph, so I didn't have a lot of equipment. We had to do a fair amount of glass blowing. We made a little device in which there was a quartz spring from which you would hang the sample that was being freeze dried. Then we would use a traveling telescope, a telescope on a mount, such as you go up and down vertically, in order to read the position of the spring at any time, and thereby know the weight of what we were drying. Thereby, we would know how much water had been lost so far in the drying process. With regard to that glassware, there was some rather complicated equipment there. The College of Chemistry had a glass shop, which was just absolutely marvelous for making such things. A man who did nothing but blow glass for his whole career. Getting that sort of support service was a real plus. The college has always been full of these shops and services as needed. Now they recharge heavily to grants for them. In the early days, they didn't so much. That has been a real positive aspect of the Berkeley location.

09-00:02:26

Redman:

And this was exclusively funded by the USDA [U.S. Department of Agriculture]?

09-00:02:31

King:

No. The glass shop is the College of Chemistry out of its own budget. Then in later years, recharging some of the costs to grants of the research that used the shop. They do this for electronic shop. They do this for nuclear magnetic resonance. They do it for mass spectrometry. The micro-analytical lab, which is a residue of the Manhattan Project, which is chemical analyses of extremely small quantities. All of that was services provided by the college. Really quite impressive.

09-00:03:14

Redman:

Was this the extent of the equipment that you needed? Most of it was built yourself?

09-00:03:21

King:

Well, let's see. I had to measure thermal conductivities. That was a matter of specially-built apparatus rather than anything purchased. At that point in my research, I was not using the gas and liquid chromatographs that I used so much in my later research. It was mostly this specially-constructed glass or metal equipment.

09-00:03:48

Redman:

This is perhaps a very silly question. Did you work on any materials other than turkey?

09-00:03:59

King:

Yes. Not during the first project. As long as the commodity was poultry, it had to be poultry.

09-00:04:05

Redman:

At that point, it was only turkey?

09-00:04:09

King:

Yes, it had to be. Then later on, things widened. I got some research support from the USDA that I believe was associated with fruits and fruit juices. Actually used synthetic solutions rather than actual juices. We did a fair amount of work just simply drying sugar solution to remake powdered sugar, since that was a nice, controlled system. That was the sequence, from the solids, which were turkey, to liquids, model liquids, that would enable us to understand the various phenomena. For example, for the work that I mentioned involving the collapse phenomenon of collapsing back into a blob without pores, there we would make various synthetic solutions. We knew their properties and did that in order to vary conditions and see how well our theoretical explanation would work for the various conditions.

09-00:05:17

Redman:

Where did funding for that subsequent research come from?

09-00:05:21

King:

It was the Department of Agriculture. I subsequently had some money from the Army Quartermaster Corps, which changed its name at some point. The Army went from having Signal Corps and Quartermaster Corps to not having them. The Army Quartermaster Corps in Natick, Massachusetts gave me some support at one point, relating to compressed freeze-dried foods. But other than that, it was the Department of Agriculture. With some interesting internal politics on that. This came out of the agricultural support budget for the University of California, in the sense that there was a block grant of USDA money to the university. That was not true of the first poultry commodity grant, but of some subsequent grants, that was the way it worked. It raised the issue of funds from the agricultural research block support of the university by the federal government going somewhere other than the College of Agriculture and Natural Resources. There were some concerns about that from people within the College of Agriculture and Natural Resources, which subsequently became just the College of Natural Resources. It actually was taken up to fairly high levels of the university as to whether this was an okay thing. It was determined it was an okay thing.

09-00:07:15

Redman:

What types of publications came out of this research?

09-00:07:19

King:

Journal publications. I was very careful to publish mostly in places like the AIChE Journal, which is a recognized premier research journal of the field. Also, to reach the audience, I would publish some in the food engineering or food processing journals. But the main research would go in the AIChE Journal or something called the Chemical Engineering Progress Symposium Series, which was also a standard publication outlet for chemical engineering. I had the problem of reaching two audiences. One was chemical engineers, and that's why their journals. The other was the people who would be looking for things to use with regard to processing foods. That would be the food engineering and food processing journals. The meetings I would go to—for freeze drying, the meetings were usually not AIChE. The biggest thing at the time was symposia that were held internationally. Quite early on, I went to one international freeze drying meeting that was in Switzerland, at Burgenstock, which is high up above Lake Lucerne. Magnificent view. It was organized by a man named Louis Rey, who was the senior research executive of Nestle Corporation. Very international. People from all over the world. A subsequent different version of that I remember going to in Croydon, England, which is just south of London. Not so much presentation of this work at professional meetings of AIChE, because the chemical engineers were so rare in the business that there weren't symposia on these things at chemical engineering meetings.



09-00:09:28

Redman:

This might be a difficult question to answer in that there weren't very many chemical engineers, or any, working on these problems. Was it professionally expected of you to do things like attend meetings with food scientists, with food engineers? Or was this something that you knew that your work would be interesting, so you wanted to bring it to them?

09-00:09:54

King:

I believe that the most important thing was my publication output and what was in those publications. With regard to the meetings, I found them valuable because they were the only opportunities I had to talk with other people who were well-immersed in the field and thinking about the same things. So they were useful for me for input. It was also a way to get the research put out there to people who might actually use it to do something. I think going to the meetings and having papers accepted there was useful for judging my academic prowess. Not as useful as a good printed paper.

09-00:10:40

Redman:

I assume that the tenure process was different in some regards than it is now, but those activities and those publications, not in traditional chemical engineering journals, for instance, would be of some value to the department?

09-00:10:56

King:

Oh, yes, and was well recognized. Again, what was going on in those days was nothing more or less than to have your peers at UC judge the creative quality of your research. That would be done by your fellow faculty members in the department. It would be done at higher levels by the whole process of personnel cases, where there's commentary by deans, and then there's the campus-wide budget committee, as it is for Berkeley, or CAP [Committee of Academic Personnel] as it is for other UC campuses. Then eventually, make its way up to the provost and the chancellor's office. All these people would be looking at it. I was quite aware that that would be judged for its creativity. I was never given goals in the way of numbers. In fact, if anybody said anything, one or two papers are fine, if they change the world.

09-00:12:01

Rubens:

Is that why you become associate professor so quickly?

09-00:12:07

King:

I became an associate professor—I guess that was relatively rapidly. In a sense, I had some career before I got here, in that I'd had the two years at the Practice School station and the year and a half back in Cambridge. I had written some papers back there in Cambridge, including the one that I think I mentioned in an earlier interview, on the additivity of resistances, which was my own thing. It's just a

byproduct of my doctor's thesis. I think that certainly was recognized as an original contribution. I had some jump with regard to getting recognized publication output on creative research before I came to Berkeley. I came in '63. Associate professor is '66, three years. That is rather quick.

09-00:13:12

Rubens:

That article is published in '64. On additivity.

09-00:13:16

King:

Yes. Which means I finished it after I got here. There was a quick avenue to a paper. Another one is one that's '66, I think, that is in Industrial Engineering Chemistry Fundamentals, also on the additivity of resistances, but in a different way. That's the one where I was carrying the computer cards up and down the hill to Lawrence Berkeley Lab in the summer of '63.

09-00:13:49

Rubens:

And a lot of papers in '66.

09-00:13:51

King:

Yes. A banner year.

09-00:14:06

Redman:

You had mentioned earlier that Ed Hirschberg's freeze drying company, was in correspondence with your group. By your group, do you mean a group of graduate students?

09-00:14:22

King:

Yes. This was Ed Hirschberg we're talking about, who had a company that was eventually taken over by Mountain House. He actually came to the lab a few times and, in that sense, met with the group. Then he was in Switzerland and in Croydon, England and so forth, at all those conferences.

09-00:14:48

Redman:

I'm assuming it probably varied by year, but about how many graduate students did you oversee in these projects?

09-00:15:00

King:

I think I probably had a group of about six at a time in those early years. I actually have in my possession a timeline of all my graduate students that would answer this. This shows you something about me. I kept gluing page after page of graph paper on end, and drawing arrows as to who started when and who finished when, just because it was interesting to me and good to have a record of. I think in those early years, I started off with three in my first year. It was Alan Kosinski, Ed Hausman, and I think Charlie Byers who became my first

Ph.D. graduate. As the freeze drying work came along, I probably got up to about six in the group. The largest I ever got was fifteen, which is too big. In my dean years, I was at about ten to twelve, which was also quite large for a dean. But in those early years, about five or six. I think in terms of advice to anyone, you need to have enough going on so that something will succeed. You don't want to put all your eggs in one basket or two baskets. You want several baskets, since the nature of research is, as you go into it, you don't know how successful the output will be.

09-00:16:39

Redman:

It's difficult to assess yourself, but what kind of an advisor were you? What was important to transfer to your students?

09-00:16:53

King:

I know what my own thought of how to do it all was. I've also had what's been fed back to me by students over the years who have said things to me about how I did it. Let's start with that one. What has been said to me is that I gave my students far more running room than did most of the other faculty members. The other faculty members, it would be, do this this week, do that next week. I have always worked on everything, and this includes administration, by valuing conversations and discussion with people, and ideas being hatched by more than just me. That's what I would do with my research students. When I met with them, have a conversation about all the ins and outs of this. What they were thinking of. Why did they think something was important. If that looks like that's got a glimmer of being something that is indeed important or potentially successful, then take it and run with it and build on it and build it into your own thoughts. In that sense, I don't think it would be possible to take any of my projects with my research students and say, King did this and student did that. It wasn't that way. It was totally interactive on all elements as we went along.

I can remember times when a student would want to do something or other. I would think, this doesn't have a lot of prospect, but what the heck? They thought of it, they want to run with it, so they run with it for two, three weeks. Occasionally, one of those things worked out quite well. A very interactive, very co-developed with regard to the guidance of the project, and always looking for an output that would be something with real meaning to the field. Either the intellectual field or the community of potential users of the engineering output. Then the other thing, and you have to do this as a faculty member, is to try to design a program of research where one part builds with another and it makes a coordinated whole that in some way is bigger than the sum of the parts. That's not real easy with the difficulty of getting government grants and the short time spans of government grants.

09-00:19:34

Redman:

It sounds like you, consciously or not, developed an environment that you yourself would have thrived on in your early years: a place that you can design your own projects but have some sort of structure needing to fit into that framework. I'm curious as to whether you think that, in structuring your lab in the way that you did and having the environment that you did, if that led to sort of a self-selection of different types of graduate student researchers, or if you were able to sort of teach these values of research.

09-00:20:19

King:

Possibly there was some selection of graduate student coworkers associated with this. But if so, it would be hard to ferret it out. In part, the nature of the matching of students with faculty in chemical engineering is very structured and very egalitarian. What is done is that students are asked in their first month or two to go around and meet with faculty members who have research projects open. They're equipped with a list. King has these two projects open. Wilke has these three, Goren has those two, et cetera. They look at those and the names of the projects. Then what we typically do is each faculty member holds a session of an hour or two where you just talk about your research and what the open projects are. Whatever new students want to come to that do come to that. Then at the end of this procedure, on a certain date, each new student turns in a ranked list of what faculty members they would like to work with. One, two, three. Then—this started in the days when I was vice chair of the department as one of the early things I actually structured up—the vice chair then takes all of these, looks and sees how the student choices match up with the availability of projects from the faculty, and next goes and has a bunch of discussions with the faculty members. Well, you've got these two students who are interested in your work, and those three. You try not to tell the faculty member who picked them first, who picked them second, who picked them third, because you're going to have to make a grand optimization at the end of all of this to get all students matched with all projects. That's how it happens. Therefore, it's a little hard to judge what it was that attracted a student into my group, or what process I used with regard to picking a student. Often, the end result of this was you just hit it off with some two or three students, and yes, you were their first choice, and that was the match that got made. This all had to be done within an entire matching system for the whole department. It was more complicated than that.

09-00:23:05

Rubens:

Could I just clarify something? This presentation and the ranking—happened when you were vice chair?

09-00:23:15

King:

I structured that when I was vice chair. It was informal before that.

09-00:23:18

Rubens:

I see. I was wondering also—you were probably getting to this—when you are director of admissions, which is pretty early on, '64, if you're looking for certain kinds of graduate students.

09-00:23:37

King:

No. In the admissions work, I was doing a judgment as to what would work best for the department as a whole. Not my own group, nor my own type. What I would evaluate as a graduate admissions officer—and I have to say something about how that was done, too. One thinks of admissions being done by committee. Not so in chemical engineering in those days. It was one person did it. I was, in a sense, working with and for the graduate division, because I wouldn't send the admission letters. The graduate division had to send the admissions letter. I would supply them with the names to be admitted. I would review a file. You look at the academic record of the student. You look at their personal statements. You look most especially about what others had to say about them. They had to have three or four letters of reference. Are we on to admissions now? If so, I'll go further.

09-00:24:42

Redman:

Not quite, probably. We're almost there.

09-00:24:45

King:

Almost there, okay. I'll hush.

09-00:24:53

Redman:

I'm interested in what role the graduate students played. Obviously, there's just going to be such a huge variety of answers to that. Since you spent some time specifically talking about your poultry freeze drying project, what types of projects did your early graduate students do for that? I assume that they were involved in the poultry freeze drying process.

09-00:25:23

King:

Yes.

09-00:25:24

Redman:

What sort of things were they tasked with? What did they decide to work on?

09-00:25:28

King:

I would have a grant where I've specified such and so activities will be done as part of the grant. I then am faced with separating that apart into bites of the right size to fit a doctor's thesis or a master's thesis. We had quite a few master's students in those days. There were some of each. I would try to define something that was self-contained enough and yet gave the amount of intellectual running room that would be right for a doctor's thesis. Then I would try to define something much more limited for a master's thesis. A doctor's student

is going to start off with many months, maybe a year, even, of sort of learning the field and the background to build on. A master's student, you can't do that with. You've got to give them a specific task, because the time isn't available for them to learn the field that well. I would take what the grants had said I would do and divide that apart into pieces that would fit a graduate student. Among my criteria were intellectual challenge, sufficient unknown to be researched, and doable in about the right length of time, and focused.

09-00:26:56

Redman:

Was that a difficult decision? You had a few years of experience, but you hadn't spent that much time in the lab yourself, relatively. Was it difficult to make those decisions?

09-00:27:08

King:

But that's what I do. That's what I've done throughout administration. Take complicated, complex situations, structure and divide them up into manageable-sized problems or research projects or whatever. It was a natural, I think, for me to do that sort of thing. I never found it all that difficult to do. I just did it.

09-00:27:36

Redman:

That's interesting. I do know that you are itching to talk about your graduate admissions work. Before we do that, I have some sort of outside of the university, outside of your academic role there, I suppose. We talked a bit about this last week after the cameras stopped rolling. Do you recall the installation of the reactor at Berkeley?

09-00:28:09

King:

The nuclear reactor? That's much later in my career.

09-00:28:14

Redman:

Is it? Oh, I thought it was in the late sixties.

09-00:28:15

King:

I de-commission it. I don't use it or create it. I'm provost. On my first day as provost, I learned that I have a nuclear reactor to decommission, but I think we ought to reserve that.

09-00:28:26

Redman:

Okay. My question really was whether there was a buzz around campus about this installation, but if there was, you knew nothing about it.

09-00:28:35

King:

Yes. it was in engineering. I'm in chemistry.

09-00:28:45

Redman:

I'm also interested in your take on the Free Speech Movement, which I think was just the second year that you're here.

09-00:28:50

King:

Yes, that is rather soon after we got here. We arrived in January of 1963, and the Free Speech Movement, I believe, starts October of '64. That's relatively soon. We've had a year of old Berkeley before this happens. I had no knowledge at that time about the loyalty oath controversy that had preceded this, and therefore didn't have in my mind that Berkeley could be a hotbed of political concern or activism. I do remember well the origins of the free speech movement. Of course, the Daily Cal, I think, covered it pretty thoroughly at the time. I do remember, I guess even back then, the clock radio was set to KCBS in the morning. I remember the day that came on and told us that here was this police car, with Jack Weinberg in it, that was surrounded by the concerned students and others on the Berkeley campus, and hadn't been able to move off of Sproul Plaza, and arrests were to be made and all of that. I remember that quite well.

With regard to involvement or reactions to it, or feelings during those times, I think they come from a combination of several sources. One is, here we were, uprooted Easterners from an orderly society, and even if it wasn't orderly, the military family had certainly been orderly. Oh my goodness. What is this? What, they're complaining? They're saying that the organization is all wrong? How can they possibly do that? That sort of reaction. A second thing was that the College of Chemistry wasn't much in it, except for efforts to smooth things out after things started. There are two people from the College of Chemistry who take roles there, [George C.] Pimentel, a chemist, and Ted Vermeulen, from chemical engineering, was on the original committee on changes in scholarship and intellectual life that eventually gave birth to the Muscatine effort.

But other than that, the political interests of this group were not there, in either chemistry or chemical engineering. There was no question about whether the college people would think that the university was right or the demonstrators and activists were right. They would pick the university. It's just the sort of people that were there. I remember some very interesting times with it. We used to have many Academic Senate meetings, which were very well attended. They would be held in places like the International House Auditorium or the Pauley Ballroom. I remember one in the Pauley Ballroom, where the issue was that Clark Kerr had resigned. The question was whether to ask him to un-resign and continue as president—this is long before the issue of Kerr and the regents in '67. Kerr, as a stance on something, had said that he would resign. This senate meeting was, do we ask Kerr to un-resign? We all went down there together because everybody had adjacent offices. We walked together, and about six or seven chemical engineers sat in a row in a set of seats. Right ahead of us is another row of people we don't know well. Well, that turned out

to be the anthropology faculty. The time came for the vote on this resolution as to whether to ask Kerr to un-resign. In Academic Senate fashion, the wording of the resolution was such that yes was not to ask him to un-resign, and no was to ask him to resign. I remember when the vote came—it was a standing vote so that the tellers could count all the votes—for yes, which was that Kerr should stay away, the whole anthropology faculty row stands up, and for no, we should ask him to continue as president, the whole chemical engineering row stands up. Just one memory from those days.

The senate meetings were fast and furious then, and full of great oration. I would sit there in awe of the oration and then watch all the parliamentary procedures as decisions were made as to who could talk and what would happen next. The parliamentarian in those days happened to be Dick Powell, who was also chair of the chemistry department. He was sitting up on the stage, making all of these judgments as to who could do what. It was very, very impressive. Of course, now that I've seen the senate from all sides, it's probably less impressive, but for a brand-new person on the scene, it was all quite impressive, and weighty issues. But surprisingly little involvement from people in the College of Chemistry in it one way or the other. We did—

09-00:34:45

Rubens:

Meaning students and professors?

09-00:34:48

King:

Yes, I mean that. The activism, or demonstration, or marches, and there were those, the noontime rallies, they would get up to the college sometimes. One feature we had was maybe 1965, somebody chose to throw a stink bomb, butyric acid, into the entryway of the chemistry library. It remained there for three years, the odor. You had to walk through dirty socks going in and out of the chemistry library. The other interesting thing, and this was after I became a vice chairman for the department in '67—we still had these things going on, on other issues. Eventually Cambodia, but other things as well. Have I mentioned this? The chair of the department was Charles Tobias. He was part of the noontime hearts game. I think I have mentioned this one.

09-00:35:54

Redman:

You did, but not on camera.

09-00:36:00

King:

Oh, okay. Charles was a member of the hearts game, which occurred at a big circular table in the corner of the bar of the Faculty Club. It had people like George Maslach. I think some of the prominent



chemists were in it as well. A very high-powered game of hearts. I knew how to play hearts, and I—

09-00:36:22

Rubens:

Science faculty more than—

09-00:36:24

King:

And engineering. But probably not exclusively so. I remember being advised early on, don't get anywhere near that game. You'll be taken to the cleaners, unless you're professional tournament-level hearts. I never participated in the hearts game. This would take Charles Tobias away from Gilman Hall from twelve until maybe two o'clock. Of course, noontime was rally time. We would have rallies come up our way.

It became known at some point during this that there was a hydrogen plant in the basement of Gilman Hall. This was William F. Giauque's hydrogen plant for achieving extremely low temperatures in his research that was Nobel Prize research. We had a hydrogen plant. Since the hydrogen bomb was an ogre of the day, that was readily confused with a hydrogen plant. Several rallies came into Gilman Hall, wanting to do destruction of some kind or another having to do with the fact that there was a hydrogen plant down underneath. They would rip the postings off the wall. We would have big clip hangers of all the announcements of other graduate schools that had come. Tear that, spread it around. I had one member of the faculty who was particularly concerned about this, and very orderly in his approach to life. He announced that he was going to turn the fire hose on these people if they ever came while he was there. This was one of my very early administrative challenges. Here I am, a vice chair who is, I suppose, acting chairman of the department during the hearts game. What do I do if this crowd comes into Gilman Hall and this guy starts turning the fire hose on them? Fortunately, they only came once while he was there, and he did not turn the fire hose on them. That's another aspect of the demonstrations of those days that hit somewhat close to home. Basically, at the beginning of all of that, we were from such structured lives, I guess the Army and my father being part of it for me, that it was just kind of mind-blowing that people would take such stances against the wonderful, noble university. Why are they doing that? Now, of course, I've come to know this issue much more over the years, but that's how I started.

09-00:39:02

Redman:

Did you become more sympathetic?

09-00:39:06

King:

I certainly recognized the issues and the causes, and particularly as I got into campus-wide administrative matters. I think really to take me

over to an active university viewpoint and multi, multidimensional university viewpoint of these things, it took my becoming the dean of the College of Chemistry, which brought me into campus-wide meetings. That was the situation where I first started interacting with people from all sorts of disciplines.

09-00:39:41

Redman:

You have a long history of being involved with university administration. Would you say that the Free Speech Movement, or perhaps the few years of activism, was that a turning point for the university, would you say?

09-00:40:00

King:

Oh, I think it was, sure. It is by far the strongest set of student reaction demonstration sort of thing, activism sort of thing, that has gone on in what is now forty-eight years with this university for me. By far the most in those days, up through the Cambodia incident, which I think was early seventies, right?

09-00:40:25

Rubens:

1971.

09-00:40:28

King:

There's never been anything like it since then. With regard to turning point, sure, it was a turning point with regard to real roles for the senate on many different things, widespread consultation in university administration. I think that became much greater. We of course had as a result of this the dismissal of Kerr as a president. The fact that that could be done and would be done was something of a turning point for the university, too. That hadn't happened before.

09-00:41:13

Rubens:

Do you remember any students at all who might have been involved with the occupation of Sproul Hall and the arrests December 2?

09-00:41:24

King:

No, none that I knew.

09-00:41:28

Rubens:

Hans Mark talks about going down to Sproul Hall and dragging out some of the students, saying, "Get out of there."

09-00:41:37

King:

Really? No, I wasn't that type.

09-00:41:46

Rubens:

Do you remember it being taken to department meetings? Being taken up or being discussed?

09-00:41:52

King:

Largely, no. The most involved the chemical engineering department got on this was in the latter part of all of this activity, which was an association with Cambodia. It was the issue of was the chemical industry vicious in some way, or did it have inappropriate standards? The napalm issue came on during the Vietnam War. Then with the Cambodia year, we got to where there was a set of students who were given a room on the first floor of Gilman Hall to work out of, who were putting together groups of other students to go and picket Stauffer Chemical, Chevron's refinery, places like that. That's the most that the chemical engineering department got drawn into these things. It was late as that issue became ripe. There were graduate students—most definitely, there were graduate students, including ones who'd been very successful in life, who became activists and were out there picketing those companies.

09-00:43:15

Redman:

You had said when you and your family first moved to Berkeley, it was somewhat conservative, kind of sleepy. Did that change? Did Berkeley itself change?

09-00:43:27

King:

Oh, yes. Well, Berkeley city politics changed. There's never been another Republican elected as mayor since Wallace Johnson. Yes. It was right in that period and in the decade afterwards that Berkeley city politics sharpened up so much. That was a changing point for the community of Berkeley, the city of Berkeley, for sure. It also related to when the students got the vote. I've forgotten when that was, but that was reasonably early on. Now who were the electorate of Berkeley had changed.

09-00:44:14

Redman:

It doesn't seem like there have been very many adventures that you and Jeanne don't take with stride, but what was Jeanne's reaction to all of a sudden her community becoming very radically different? Was this at all a concern?

09-00:44:33

King:

Probably great appreciation for the fact that we had bought our home in Kensington rather than in Berkeley. Just stay away from it.

09-00:44:48

Rubens:

There were rumors that there were going to be drugs dropped into the water system. Police surrounding some of the manholes.

09-00:44:59

King:

Yes. I do remember those days.

09-00:45:02

Rubens:

Once again, Hans Mark said that he had police in the basement of Etcheverry [Hall], just to make sure there was no assault—

09-00:45:11

King:

For the nuclear reactor. Yeah. That's interesting. No, we never had police in Gilman, although we did report this interest in the hydrogen plant to them. I guess I have to explain that that hydrogen plant has nothing to do with hydrogen bomb, in effect. In actuality, it's just a matter of turning the gas hydrogen into a liquid so that that liquid hydrogen can be used in another refrigeration cycle to liquefy helium, which is what got [William F.] GIAUQUE down to temperatures very close to absolute zero. Nothing to do with the bomb, unless you threw a match into the hydrogen.

09-00:46:08

Rubens:

Let me just ask two more questions about the Free Speech Movement. You talked about being impressed with the level of discourse in the Academic Senate. I wonder if you remember the Academic Senate meeting at Wheeler Auditorium, where faculty did overwhelmingly vote to support the students.

09-00:46:28

King:

I was in Boston for that. I was giving a presentation at the annual meeting of the American Institute of Chemical Engineers on one of these papers we just talked about, so I was not present for that. If I had been in town, I surely would have been there. But I wasn't, and so I have no firsthand recollection of it.

09-00:46:49

Rubens:

So you have no experience with faculty in other departments trying to persuade you to—

09-00:46:58

King:

I think the chemical engineers were probably regarded as a lost cause. Although I have always wished I knew more about the participation of Ted Vermeulen in the committee that was formed to consider alternative education. Neil Smelser's book tells about that. The book that he's published, 2010, with UC Press. He writes a significant amount about Vermeulen in there. Ted never really talked about it with the rest of us.

09-00:47:39

Rubens:

Should we round out your position as admissions, because that's in '64, isn't it?

09-00:48:03

King:

The nature of graduate admissions, this was both domestic and international. The chemical engineering department in those days admitted quite a few international students, one reason being that we

had both the doctor's program and a master's program. Probably there were more admissions to the master's degree than to the doctor's degree. That is not the case anymore today. We had the possibility of the plan one and plan two masters. It was a lot of students to be admitted. It was about fifty admissions a year. A lot of—

09-00:48:39

Rubens:

For master's or for the whole—

09-00:48:40

King:

The whole thing. The sum. That was a lot of files to review. We probably had four times as many applicants as we had spots. That was a lot of files to read. I did that all myself. I would make the judgment on various issues of academic quality, with letters from elsewhere being very important among them. Often for the international students, there was not a lot to go on. I have had a running repartee over the years with a friend who I admitted very late in the game, in '64 or '65. I think it was late May that I admitted him. His name is Chatterjee, and he was from India. He was from Calcutta. I had filled the class. It was all done and over with, and in came his application. I've always thought he was a late applicant until I had dinner with him a month ago and discovered that no, his admissions packet had been sent to him by sea mail rather than airmail by the Graduate Division, and that's why he applied late. Anyhow, he applied late. I looked at this. I thought, I'm full up. I can't do this. But I don't want to throw it out. I'll put it over here. Then I'd look at it again. While I can't do another one, this does look good. Put it over here. I eventually admitted him. Of course, he became a very successful vice president of Air Products and Chemicals after getting his degree and graduating. There are a number who were admitted in those days who have had quite successful careers. It's a good feeling to feel that one took the step that let them in here, brought them here, and enabled them to move forward to these careers. I mentioned Paco Barnés. He was both a master's and a doctorate student [with me] and was surely admitted by me during the years I did graduate admissions.

09-00:50:47

Rubens:

How did you come to have that position as admissions officer?

09-00:50:52

King:

Okay, that's an interesting question. It was done by a professor named Gene Petersen the year I got there and I think maybe the year after. It came time for Petersen not to do it. The chemical engineering department assigned all its jobs around. I may even have been asked what was I interested in doing. I am not dead sure of that, but I think that was probably the case. I indicated that was one of the things I would be interested in, just because it looked to me like it was mentally intriguing. It was obviously important. I always, from early

on, wanted to try myself out on administrative things. I went through a succession of steps where I would be asked to do something. I would think for a few moments as to, would this be fun? For the things of an administrative nature, I would say yes. Then found I would get into sort of a challenging situation as to how to do it best. I did a lot of defining of how best you would do the graduate admissions process. I did, as I mentioned earlier, much of the defining on this great process for matching students with research directors. That was the first year I became vice chair. There were industrial funds that were used by the department chair for good purposes around the university. We'd had a very generous chair up to that point who had gone broke every year with the industrial funds. Here they were, practically in receivership. Could I structure up a way to do that better? I did that. It was always another step towards finding out a best way to do something, organizing things. The graduate admissions job was really my first substantial step into that sort of thing.

09-00:53:03

Rubens:

How long did you do that?

09-00:53:05

King:

I think I did it two years. Maybe three, before I became vice chair.

09-00:53:11

Redman:

I'm curious, too, you speak passionately about it, and it's very clear that you really see the value and the importance in that job. Would you say that that's a sentiment shared by just about everyone who takes this position? Or do you think that not everyone does? That some people consider this committee work, for instance.

09-00:53:36

King:

Well, you have to understand the ethic of the university, which is that no one would ever express interest in an administrative job. One has to play the game recognizing that fact. Therefore, did anybody else around me evidence or say in advance they would have an interest in doing these things and love to do them? The answer to that is no. But then how much of it is the university ethic that I just described, and how much of it was really no? I do think that I had more of a penchant for these things and an ability to organize them up and get them going well and working right than most others did. I would say the large majority of the faculty just simply aren't interested in that. Why should you spend your time on administrative things when that time is going to be less time on the research that's going to make your name as an academic? That's, I think, where most other people would come from.

09-00:54:46

Redman:

Would you say that you saw your work in admissions as something of a puzzle to be solved? You sort of talked about putting lots of pieces

together and organization. It strikes me that this might be somewhat of a problem-solving type of thing.

09-00:55:08

King:

There was definitely an issue of how to take 200 applications and make sure that you sought the most important things in each one. You had to distill the application and get those few most critical things for your decision. How to do that and doing that, I think, is something that appealed to me and which I worked on. It was also a way to know a lot more about all these graduate students who were coming. When you do a job like that, or this matching of students with research directors, you know all the graduate students, not just some. That was satisfying.

09-00:55:52

Rubens:

You sound almost altruistic about how you admitted students, though. Was there no sort of sense that, well, I want to build up a couple of professors over others or—

09-00:56:08

King:

No. It was strictly a picture of what is the right quality value judgment, and then applying that. It didn't relate to any area of research more than others. That does happen today, and it happens in chemical engineering for an interesting reason, which is the arrival of biochemical engineering as such a big subcomponent of chemical engineering. The issue that has arisen annually for the last ten or more years is 80 percent of your applicants may be interested in biochemical engineering, and 20 percent not. Yet 25 percent of your projects are biochemical engineering, and 75 percent are not. So what do you do? Are you going to put a quota on biochemical engineering applicants? I don't know the answer to this because I'm not close enough to the department to know how they do it nowadays, but that question surely arises. There's a mismatch between the spectrum of interest of the applicants and the spectrum that is represented by the available projects from the faculty. You have to do something about that.

Interview 5: May 17, 2011

Audio File 10

10-00:00:01

Redman:

During our last interview, we talked about your research program and the first few years that you were in the chemical engineering department. Soon, I'd like to talk about your first book project, but I actually wanted to just briefly go back. You had talked a little bit about a patent that you held. You did speak about the changing legislation about patents and patent holding among faculty members. I'd be interested to hear from you what that history is, since a lot changed in the time that you started.

10-00:00:48

King:

Yes, a lot has changed. I have something like fourteen patents; of the 14, 7 were before Bayh-Dohl, and 7 were after. As I think I mentioned yesterday, the situation before 1980 was that patents on research that was done under government grants belonged to the government, with the requirement that the government put it in the public domain. The idea of that had been that the inventions could be used by anyone, anywhere, and that was a fair way for the government to treat people. The problem with this was that there was no commercial incentive for a company to take and own a patent and run with it and invest big money in it if everybody else could use the patent, too. That's what led to the Bayh-Dole Act of 1980. The Dole is the Dole who ran for president later. The Bayh-Dole Act redefined things and said that patents resulting from research done under federal government grants belong to the institution where the research was done, so in the case of this university, the University of California.

I remember, back in the very early years of that, dealing with the Patent, Copyright, and Trademark Office of the university, which was two people. By the university, I mean all the campuses of the University of California. This was a unit of the Office of the President. Of course that grew enormously after Bayh-Dole and has become the Office of Technology Transfer that we have today. There's been a lot of decentralizing of that to the individual campuses. The difference has been that the university then owns these patents and it can license. It can decide how many licenses to make, whether to make it an exclusive license. The result for corporations is that they can then have single ownership of an invention. If they then wish or need to invest more money to develop it and bring it to market, they can do so, knowing that they're just investing in themselves and not all of their competitors.



Just one final comment on this. The dynamics of this whole business of patents differ enormously across the segments of industry. Where my research was, in areas like foods and pharmaceuticals and the beginnings of biotechnology, there is a lot of incentive for patenting and ownership, because very typically, a company has to get something approved by the Food and Drug Administration [FDA], with a big investment and all of the testing that can win that approval. They've got to invest big money upfront. In an area like the electronics industry or the computer industry, the patenting is not as important, and is even felt by some people in that area to get in the way of things. Later on, as I got into the provost position for the system, how to have a set of rules that allowed for all of these variations was a challenging problem.

10-00:04:28

Redman:

How did this impact university research?

10-00:04:35

King:

I think it created more of an interest among faculty in patenting. If I take the patents that I did before Bayh-Dole came along, I would simply be doing research, and then the Department of Agriculture would keep asking me, do you have anything patentable? It would help us to be able to show that we have more patents this year. The driving force for looking at things for patenting, and doing the patenting, came from the government agency, the Department of Agriculture, which, in effect, wanted to have a good report card on how much it had helped the economy. Later on, with the Bayh-Dole Act and with the inventions belonging to the university, the idea of university revenue came into the picture. The government, back before Bayh-Dole, would give you a dollar or something like that for your patent, to recognize it. The university, and most universities, do it by dividing the revenue from patents among the inventor and different parts of the university, and so there was now incentive for the inventor to get something, which put the inventor on the lookout and as the driving force for initiating patents. So I think the dynamic change [was] to where the inventor would have much more reason to try to identify things and push them ahead for patents. Then it became a matter of the university deciding whether it wished to undertake the investment of getting the patent on whatever it was. So a yes/no decision was made on that by the university. If the university did decide to get a patent, they would then engage a patent lawyer to work with the inventor to write it up, whereas before Bayh-Dole, the Department of Agriculture, in my case, wrote it up.

10-00:06:34

Redman:

I am interested in talking about your first book project, which I understand you began pretty early on while you were at Berkeley. Can

you first tell us the name of your book and when it was published in the subsequent years?

10-00:06:48

King:

The name of the book is Separation Processes. It went through two editions. One is 1971 and the second is 1980. It did receive quite a bit of use as a text. The history of this is quite early on. It's going to be very early on in my time here.

10-00:07:21

Rubens:

Before you're admissions officer?

10-00:07:24

King:

Before I was admissions officer, in my first year here. The first course I taught here was a course in separations, but I don't think it had the name Separations. Its name was something like Multi-Stage Operations. I taught it, and Don Hanson had taught it for years before that. Don Hanson had a set of notes on how you calculate distillation. He had used it in his course. Very soon after I was here, Hanson came to me and said he had been thinking of converting his notes into a book, but in order to do that, he would like a coauthor, and would I like to be the coauthor? I gave that some thought. Probably not a lot of thought, because it was easy to answer, and I said yes. Then we had a couple of meetings over lunch as to what we would put in the book and what we would call it. In particular, a question was whether it should be distillation, or whether it should be all types of separating mixtures, all ways of separating mixtures, or something in between. With a little bit of conversation on that, I voted in the direction of all types of separation, because there wasn't a book that had done that well, and there were other distillation books. Of course, being naïve and very inexperienced, I had no idea of what amount of work would be required to put together a book on all of separations. So we decided it would be all of separations.

We identified fourteen or fifteen chapters. We divided up the writing of chapters between us. I wrote, I think, two chapters to start with. One was to take Don's notes on distillation and turn them into what eventually became chapter five, on binary distillation. Then I drafted another chapter, which may have been the introductory chapter. Right at that point in time, Don Hanson became announced as the next department chair, succeeding Charlie Wilke. If I take that one to think out, I know that Tobias becomes department chairman in 1967. I know that Hanson was department chair for two years before that. This must have been in 1965 that this happened. Hanson became department chair, and he undertook the duties of department chair. Then we arranged another one of these lunches to talk about the book. He came to that lunch, which was probably three or four months into his department chairmanship, and he said, "A department chair cannot

write a book. There just isn't time to do it." He wasn't going to be able to continue his part of the project. If I wished to take this ball and run with it and complete a book, I could do so. He would cheer me on. I decided to do so.

That's a very unusual decision for somebody at the start of a professorial career. It would be even more so nowadays, where all the advice is, get your research formulated, do your research, get it published, get it out there, get other people thinking about it, and don't let anything deter you from this. Well, I did it the other way around. Without having done much research, I put a lot of my time and thinking into development of this book. I did it largely through the summers of all the years, starting there in '64, until '69, when the book was completed and submitted to McGraw-Hill. I had, back before then, arranged with McGraw-Hill that they would be the publisher of the book and had the contract with them. It was just then a matter of when I would finish it.

One more comment before we go on. I think that was, for me, a very good order in which to do scholarly things. Creating this book put my thoughts in order with regard to the whole field of separations. That would be the area of all my research. I actually came up with some new things and new ways of approaching issues in the writing of that book. There's really some original research in the book as well as just the codification of existing knowledge. I think it served me well, although it certainly occupied a lot of my time that wasn't spent on research.

10-00:12:30

Redman:

You had this idea to bring together all of the topics in separation into one book, which hadn't been done before. But if I understand correctly, that turned out to not only be a good format for a textbook, but you were able to then find theoretical links, basically, between some of these processes. Is that correct?

10-00:12:54

King:

You are completely correct. Commonalities among types of separation had been recognized in the past. Out in an oil refinery, a distillation column looks much like an absorber. Both are multi-stages, with multiple plates and big, tall towers. The commonalities of analyzing them for energy consumption, the logic for choosing what is the right type of separation in a particular application, the ways of using what is called the YX, or McCabe-Thiele Diagram, in order to analyze different types of separation, and from that be able to see what modification would help the design of the separation. Doing that as a common thing among separation processes was relatively new at the time. The history of the field is interesting. I have written a few papers

on that history. In essence, looking at separations as a common field was an outgrowth of the Manhattan Project and World War II. It arose from the need to find how under the sun, you were going to separate uranium isotopes from one another, and how you were going to enrich heavy water, which was also needed in the Manhattan Project. There were very good studies done by Manson Benedict at MIT and others. Actually, Manson Benedict was at Kellogg Corporation when he did the studies. He later went to MIT. There were very good papers that started down the road of analyzing common features of separation. It was a very good starting point for what I did. They were very useful things that came from the past. It was interesting that it took the Manhattan Project to get the general thinking going.

10-00:14:59

Redman:

You had said, too, that this book was not at all based on your own research. I understand that it has been used fairly heavily as a textbook. I'm curious as to where the material came from for this book.

10-00:15:18

King:

It came from scattered sources. Let me tell the story on a couple of those. One is the very extensive use of the YX or McCabe-Thiele Diagram to analyze a vast variety of separations. The start on that came from the fact that there were preexisting books on distillation with such diagrams in them. There were books, one by Sherwood and a coauthor, on the subject of absorption and extraction. There would be things that looked like YX diagrams used in their analyses, but the diagrams had not been taken deeper for understanding, particularly with regard to what changes you could make in order to make the design of the separation either more effective or more economical. It was in devising these common ways of looking at it to determine how you were doing in the separation, what was limiting to the separation, how you could relieve a capacity limit, how you could get a better separation if needed. All of these things. It was the utility of the diagram for those purposes was what I was able to put together new.

Take the question of energy consumption by separation processes. That was a Manhattan Project thing. It was because the gaseous diffusion plant, or thermal diffusion, which was one of the early methods for separating uranium isotopes, or the calutrons, took a very large amount of energy. The separation was very close, as the language goes, which means the two or more things being separated had volatilities or other properties very, very close to one another. You had to trade and build upon very small differences in these properties. That was what was looked at in the work in the Manhattan Project by Benedict and others. Benedict came up with some very good theoretical analysis of that for gaseous diffusion, thermal diffusion,

and the processes that were looked at for uranium separation. It was a matter of taking that thinking and extending it, and also drawing on a background in thermodynamics and free energy concepts to get generalized approaches for analyzing energy consumptions of separation processes, and determining how one process would compare with another in energy consumption, or how you might tweak a particular design in order to gain less energy consumption. Those are a couple of examples.

I think the way this worked was just to take the general idea of putting separations on a common footing and a common basis of understanding, and then run with that ball. It had been done previously for the Manhattan Project things. If you look at the sequence of books and writings and things that people came up with, there was Benedict's work and Karl Cohen's work during the Manhattan Project. Then a man in Australia by the name of Clive Pratt took that and added distillation, because deuterium was separated from hydrogen by distillation of water, and getting heavy water out of it. That was another flow from the World War II atomic energy work. Pratt's book existed. Then I just tried to bring everything else I could in as other methods of separation to fill out that analysis.

10-00:19:41

Redman:

What books were influential to you? You've mentioned some that you used, but were there any other books that were influential in terms of how to structure your own writing?

10-00:19:53

King:

You've been reading my papers. One very influential book was a book on distillation by a man named Robert Hengstebeck. He was actually an industrial employee, I believe with Amoco, and he had written a book on distillation. He started using the YX diagram in a lot of different and new ways with regard to distillation. Seeing what he had done with this for distillation is what gave me the idea of running further with the diagram, in ways similar to what he had done. That is certainly an influential book. There's a Manson Benedict paper that's in the very first volume of Chemical Engineering Progress, 1947, that reported the research and determination of common properties that he'd done during the Manhattan Project. That was influential, too.

10-00:20:59

Redman:

What about people? Who did you go to for consults for reading over chapters? Who was involved with that process?

10-00:21:12

King:

Well, I assure you that when I took Don Hanson's notes and turned them into a chapter on binary distillation, I then took the chapter back to Don Hanson. That's one thing I did. I believe I completed this

project before Tom Sherwood came to Berkeley, so I was not making use of him at the time. Hanson was really the one other person at Berkeley that I could bounce things off of. This is dangerous to do, but I think, by and large, it was a matter of my project all the way, and my assessing it and reassessing it and reassessing it. In hindsight, it would be far better to get some other knowledgeable people looking at it and making sure I wasn't leaving something out or analyzing something the wrong way. I didn't get much external assistance at all on this.

10-00:22:15

Redman:

You mentioned that McGraw-Hill was your publisher, but can you tell me about the process of securing McGraw-Hill as your publisher?

10-00:22:22

King:

Sure. There were about three publishers that had series in chemical engineering at the time. McGraw-Hill was long-established. I did mention back in another interview how it was the authors of the books that had drawn me to MIT, and indeed those books were all published by McGraw-Hill. For an impressionable youngster, oh boy, I, too, could be on that list of authors and books inside the frontispiece of any McGraw-Hill book. That made McGraw-Hill of interest. Prentice Hall was another new one. Prentice Hall had been put on to me, I think probably by John Prausnitz, who had a book of his own with Prentice Hall. It was a relatively new and small series. Then Wiley would have been the other one. Wiley had some very influential chemical engineering books, the biggest one at the time being Bird, Stewart, and Lightfoot's Transport Phenomena book. The Bird, Stewart, and Lightfoot book is the book that transformed chemical engineering from being just practical engineering to being highly science-based.

10-00:23:45

Redman:

And you picked McGraw-Hill just because of the name?

10-00:23:47

King:

I picked McGraw-Hill because their contract was about the same as everybody else's, and, oh boy, I could be on that list, too.

10-00:23:59

Redman:

What did you personally find difficult in writing a book-length manuscript? This was the first book you'd written.

10-00:24:09

King:

I had the manuscript of that for many years. It was handwritten, so that's a handwritten, pencil-written book. I think the most difficult thing I've found about the project was going away from it and coming back to it, and getting my mind caught up on everything that had been in my mind before with regard to the book, and sort of having it just take over my mind. That's, I think, not a good way to write a book. To do it just one summer, another summer, another summer, another

summer. It worked far better for me when I did the second edition, which was a pretty large revision. I did that on a sabbatical leave, as the one purpose of the sabbatical leave, start to finish. That worked a lot better. The book was always in my mind. I think getting it back into my mind and keeping the flow, and what I'm going to have in this chapter that I'd better develop beforehand, and this chapter, and that sort of thing. The interactions of the book. To keep that going and to keep it in my mind was the most difficult part of it.

It was interesting that that manuscript was about four or five inches thick, held together with big, long, copper brads. I remember what happened to it, because I had just moved offices, and it would be from my vice chair office to the chair office. This would have been 1972. I decided, I don't need to move this big thing, so I plopped the manuscript into the trashcan. Then the new occupant of my vice chair office came in. It was a man named Chris Fell, who's been a lifelong friend. He's actually from Northern Ireland, but has spent his entire career in Australia. He came for a sabbatical leave in Berkeley and found this thing in his trashcan as he arrived in his office, and has several times used on me the line that there he was, faced with history. Did he let it go or did he save it? He didn't save it. It went.

10-00:26:46

Redman:

Can you actually describe what your daily writing process was like in the summers?

10-00:26:54

King:

With regard to the book this is now? This was before word processors. If I were to write a book with a word processor, it would be so different from how I did this book. You're forced into a linear mode when you're hand-writing a book and you don't have word processing capabilities. I would have a chapter that I was working on at any particular point in time. I did these chapters not in numerical order, but more or less in order of how easily they were done. Was I yet at the point where, with regard to the subject matter of the chapter, I felt I had in mind all that I would want to use in developing that chapter? The next chapter would be always the one that I was most ready to write next in that sense. You sit and write and think and write and you rewrite. Of course, rewriting in those days was tear it up and write a new one, not the sort of thing we do with computers. A lot of iteration back and forth between thinking, exploring, and actual writing. And just keep it going, which I was able to do in those days. I'm much less able to do that now.

10-00:28:35

Redman:

Did you enjoy the process of writing the book?

10-00:28:37

King:

Oh, I sure did, yes. Picking the things I have done and the projects I have done and the organizations and so forth, the first criterion is always, would I enjoy doing it? It's not, is this the most beneficial thing for my career? That kind of thinking I really didn't use. It's just what would I like to do next.

10-00:29:07

Redman:

What was the reception of your book in the field of chemical engineering?

10-00:29:13

King:

I think it was quite good. It was one of a kind, as it came, and it was a member of that McGraw-Hill series. Those were very well marketed by McGraw-Hill. I think being a member of that series helped greatly with regard to adoption of it by other universities. Then there was something else going on at the time. As I went through school, in undergraduate work and graduate work, the things you studied were what was called unit operations at the undergraduate level. I can describe that in a moment. Then at the graduate level, specialized courses, such as reactor design, or advanced thermodynamics, or distillation, or extraction, if you ever got to it, or some other separation process. Ion exchange was one that was rarely available, but taught from time to time in institutions.

The change that was going on was this: we moved away from the unit operations concept. Unit operations was something that developed at MIT with Arthur D. Little, back around 1918 or so. The idea there was to recognize that chemical processes were assemblages of different sub-processes or units. There were not all that many different units that were assembled into processes. There might be a distillation column for separation. There might be a reactor to carry out the reaction. There might be a furnace to heat things up. There might be heat exchange to trade heat back and forth between two streams. You might do crushing and grinding. You might dry something. Et cetera. The unit operations concept had been that you should then study these building blocks, and then the creation of processes will be the assembly of the building blocks. There were very successful books on unit operations, and the concept stuck around a long time.

But the arrival of Bird, Stewart, and Lightfoot on the scene changed that. They were published [in] 1960. The book is called Transport Phenomena, as I mentioned. What it did was to look at the common, quite fundamental concepts of fluid dynamics, heat transfer, and mass transfer, and show that the same underlying equations govern them, and therefore very similar concepts govern them. That became, over a decade or so, the way of looking at the core of the undergraduate curriculum in chemical engineering. Unit operations was no longer a



concept as such. This was much more powerful than unit operations. This was going to a science-based fundamental level. If you're not going to have unit operations, what should be retained and how should you package it? A lot of unit operations was different means of separation. You should retain the concept of separation. It has often been said that there are two things that chemical engineers do uniquely compared to other kinds of engineers. One is chemical reactions and reactors, and the other is separations. Now if you can codify all of separations into one set of courses, you've got a very logical package to go into the curriculum along with transport phenomena.

I think my book arrived on the scene at just the right time for that transition, so it was taken up a lot of places. Many just used it as such, and used pieces of it for undergraduate work, and the rest at the graduate level. Others came to the conclusion that it was too complex for undergraduate work and would find a simpler something to put into undergraduate work, and then still, quite possibly, use my book at the graduate level. There were two different ways of employing it, but nonetheless, it got good use by the two ways put together.

10-00:33:56

Redman:

As you were completing the book, did you come to realize that this textbook was hitting the scene at exactly the right time?

10-00:34:10

King:

No. That is something that I rationalized in hindsight. I think I'm just lucky that way. What I was trying to do was put separations on a common basis. I wasn't recognizing that, given the arrival of transport phenomena, that package would be a very logical complement in the curriculum.

10-00:34:36

Redman:

Were you even considering that this book would likely become a textbook, a widely-used textbook?

10-00:34:46

King:

Yes, I was writing it as a textbook, with recognition that it would also be a reference book. That's what makes it large and complex.

10-00:34:54

Rubens:

Were you trying out chapters in your classes?

10-00:34:57

King:

Oh, yes. Both undergraduate and graduate. Particularly the graduate course. I had Chemical Engineering 251, Separation Processes, and that was just the book straight through, as it was being written. This was very helpful to me to be continually teaching that graduate course. Of course, there's another component of a textbook, and that is the problems at the end of the chapter. As I went along teaching the

graduate course and some undergraduate courses, I would develop problems. I would always develop a new and different problem for every test. No repetition of something from the past. Same is true for the final exams. Every year was more created problems. I very literally, towards the end of this project that led to the first edition of the book, took all the problems from all my tests and exams, cut them apart, and piled the problems into piles that went with particular chapters.

10-00:36:06

Redman:

Would you say that there is a practical component to the book, or is it mainly for academicians?

10-00:36:16

King:

I think the primary aim of the book is to develop a general understanding and foundational basis for working with separation processes. That was what I was trying to do. There are a number of things in it that do go more down the practical line. Some examples of that—one was how to do digital computations of degrees of separation attained by processes. That was rather practical with regard to applications at the time. It has been left in the dust now as the approach to chemical engineering has changed from understanding your calculations to just simply lifting the appropriate piece of software off the shelf to do the calculation. I think some things are lost with that, but that is how things have gone. So there were some practical ends. The comments I've had back and forth over the years tell me that it was a book on the library shelf of many practicing engineers. It's a book you would keep rather than selling back in. Then there were a lot that also had the textbook in their classrooms.

One of the things that I valued most happened just during the last year. That's when a fellow named Henry Kister who has been a very accomplished distillation and separations expert in industry—he works with Fluor Corporation in Los Angeles—was elected to the National Academy of Engineering. There's a tradition within the National Academy of Engineering that anybody you know who's been elected, you write them a note. You get elected to the academy and here comes this barrage of notes in your mail, or, in later years, on your email. So I wrote to Henry. I didn't know Henry well at all. I still don't know Henry well at all. Henry wrote back to me and said, oh, this made his day to have a note from me. He wanted me to know how influential my book had been in his career, and the single-most useful thing to him had been this generalization of the use of the YX diagram and the insights that it provided. That's the thing that really warms my heart, when something like that happens. There's been some of that, too.

10-00:38:54

Redman:

What was the reception within the department? Were your fellow faculty members celebratory? Was this considered just a part of the job?

10-00:39:05

King:

To have done the book? We were, at that time, not that much of a book-writing department. There is a Prausnitz book on molecular thermodynamics that predates mine. That's the one that was with Prentice Hall. That was really the first major book out of the department. The others who had started the department did not do book-writing. For somebody to have written a book, and particularly at this young age, was an unusual and new thing. It's not exactly in the tradition of Berkeley in the College of Chemistry, where Gilbert Newton Lewis was all research as he built chemistry at Berkeley. Yes, Lewis had some textbooks but they weren't that widely used. There was one on chemical thermodynamics by Lewis and Randall that was widely used. There were thoroughly used books by Richard Powell and by Joel Hildebrand on freshman chemistry. That's the exception to all of this. But it was a new thing in chemical engineering at Berkeley to have gone big on a book. There were some others that came along behind mine. Sherwood had come to Berkeley, as I've mentioned. Robert Pigford from Delaware had come to Berkeley. There's a Sherwood, Pigford, and Wilke book on mass transfer, in 1975, that was a few years after my separation processes book in 1971. That was another major book. Not having read my own personnel cases, I don't know how much the book figured in the personnel cases. My guess is that the research papers figured more. It was nonetheless a very good thing to do because it gave me a reputation right out there. That happens to any writer of a well-used book.

10-00:41:12

Rubens:

Did it do well financially?

10-00:41:14

King:

Yes. I think the first and second editions—I will have to check the number, but second edition alone sold 18,000 copies. If you turn that into a calculation of what was your wage per hour of writing the book, it's a very low wage. But if you look at the number of sales, that was quite good for a chemical engineering textbook.

10-00:41:45

Redman:

I understand that a second edition was published. What were the changes and additions that you made to that second edition?

10-00:41:53

King:

I eliminated a chapter in the second edition, which was on optimization of processes. I felt I had to put in concepts of mass transfer. I had left them out the first time around, under a concept that

people were going to learn that through Bird, Stewart, and Lightfoot-type treatments. The problem in mass transfer is that Bird, Stewart, and Lightfoot had a particular type of treatment of it, and other books on mass transfer had different treatments of mass transfer. I wasn't really in the position of being able to say, go read chapters of a mass transfer text and now you will understand what comes next. I had to develop it in my book, so I put in a chapter on the more fundamental aspects of mass transfer the second time around. Nine years had transpired between the first and second edition. A number of things have happened. The major change of the field over the years has been a greater variety of methods of separation. The lifetime of the book corresponds more or less with the development of membrane separations from being a laboratory curiosity to being very commonly used. I had to put in more on membrane separations and some other newer methods of separation. Those were the principal changes. Then I had to take out the insoluble problem, too. I had managed to put in the first edition a homework problem that could not be solved.

10-00:43:52

Redman:

You must have also been working on your second book, even as you were working on your first edition of Separation Processes. Is that correct?

10-00:44:00

King:

This is now Freeze-Drying of Foods. Yes. That one's very different, because here I had built up a body of research. That body of research was a lot of the research of the field. We had gotten into a couple of very important concepts. One I mentioned before. One I have not. The one that I mentioned before was the collapse phenomenon. The tendency to lose the porous structure of a freeze-dried product and have the product collapse. The one I don't believe I mentioned before was the concept of retaining flavors and aroma in foods. We had done a lot of research, as had Hans Thijssen in the Netherlands, on that subject and had a good understanding of what it took to retain volatile flavor and aroma components in food-like materials as you dried them. This is important, of course, because you want the product to taste good and smell good. It's challenging in another way, because the typical flavor and aroma components are far more volatile than water. Yet if you dry something, you've got to take all the water out, so how do you take the water out and not take out all of the things that are still more volatile than water? The answer was to set up a diffusion barrier at the surface of the material that's being dried, and take advantage of the fact that water is a small molecule and therefore has a larger diffusivity in a condensed phase than does the flavor or aroma component, which is going to be some higher molecular weight. [A] ketone or aldehyde or ester.

10-00:45:56

Redman:

How would you go about testing the effectiveness of this? Would you bring in people to taste things or you would you be measuring chemical levels?

10-00:46:10

King:

I would make a chemical-type measurement. This is where I started using gas and liquid chromatography. You would actually do a quantitative chemical measurement of how much of whatever it was you had lost or retained. I should go on and complete the road to the second book. We had this body of knowledge on drying rates, freeze drying rates. We had a body of knowledge on flavor and aroma retention, and knowledge on collapse. To take that, integrated with the other literature such as it was, I first wrote a review article, which was in an advances in food science-type volume. We can get the title off the list. I wrote it as a review article. That was popular enough so that the editors of Marcel Dekker, a publishing company, decided they wanted me to expand that review article and turn it into a book. That's what became the second book. That second book is more a codification and presentation of our own research, plus things related to it.

In my work on freeze drying, I had a real incentive in that the Thijssen group in the Netherlands—I mentioned him already—was very productive in very similar areas. That did two things. That expanded the knowledge of the field and it also created a competition as to who could get a newer thing than the other as the years went on. I knew Hans Thijssen very well. He died in 1984, quite suddenly. I think he was still in his fifties. That was of course a sad happening in and of itself, but it was also detrimental to me in another way, in that I lost the competition. The competition hones what you do.

10-00:48:25

Redman:

Other than this competition, how did you manage to write two completely different books at the same time? What strategies did you use?

10-00:48:37

King:

The one on freeze drying was a one-shot effort. That was not several consecutive summers, like the separation processes book had been. I had been asked to write a review article, and I did write a review article. Then I added an appendix on aroma retention, as I recall. I did some editing on the main text, but also added this appendix of some size as we turned it into a book. That was a project that wasn't picked as a book project when it started. It was, is it time to write a review article that puts our research together? Answer, yes. Therefore I write the review article. Then it's a short step to turn that into a book.

10-00:49:29

Redman:

Can you compare the reception of Freeze-Drying of Foods to the reception of Separation Processes?

10-00:49:35

King:

The freeze drying field is way less populated than the separations field, if you will. Freeze drying is one of many methods of separation, and not all that common as a method of separation. That was really serving a fairly narrow field of research. It was positively received and well referred to within freeze drying as the time went on. But that's way less circulation.

10-00:50:08

Redman:

But this project would be something that you would guess would be perhaps more important in your evaluation within the department for tenure calculations and that sort of thing, because it was based on your own research?

10-00:50:25

King:

Again, I haven't read my own personnel file, so I don't know what is in them, but my guess would be this. In terms of what was being looked for in your research, it's the stroke of creativity, the brand-new thing, the why didn't I think of this before he did sort of thing. Books are, by their nature, codification of knowledge, putting it together, not so much brand-new knowledge. My guess would be that it's the research papers themselves that carried more weight.

10-00:51:08

Redman:

If this seems like a good place for you, I'm interested to talk about your role as a consultant throughout your career. You began pretty early on working with—I think Proctor & Gamble [P&G] was the first company that you became a consultant for. Can you first just explain how you came to get that position?

10-00:51:28

King:

Yes. I had done one bounded and short consulting job with Proctor & Gamble first, and then the sustained one came along later. I'll describe both. The first one was a matter of people in Cincinnati, the home base of Proctor & Gamble, who were interested in reuse of a plant that they had in their Sacramento facility. I guess it was the fact that Berkeley was near Sacramento. They somehow ended up coming to Berkeley and looking for somebody who might assess possible ways of reusing that plant. Much of my early teaching had been on case problems and process design and processes, and so somehow they came to me, in my office, and as a real youngster—I think this was '65 to '67 or something like that—took me on to do a year, a year and a half study on what were the possible ways of reusing that plant. The idea was this. Here sits all this equipment that had been in a plant that's now no longer used for its original purpose. What is there that we could make

that makes sense for where we are, who we are, and what this array of equipment we have is in the plant? What it could do. I took that on as a problem and I came up with some ideas. One of them interested them enough so that I was actually asked to come back to Cincinnati for a day of consulting on it, which I did.

The other—it's almost accidental that it is the same company for both of these consulting jobs--the second one occurred after I had done a significant amount of freeze drying work. The corporate situation was that General Foods had invested a lot into developing Maxim freeze-dried coffee. Nestle had invested a lot into the development of Taster's Choice freeze-dried coffee. Proctor & Gamble had just bought Folger's Coffee Company of San Francisco, and so they're getting into the coffee business. The twist that Proctor & Gamble would put onto these acquisitions of food companies, and they did several acquisitions over the years, is that they would have the research ability that their competitors would not have, and they would be able to base things on quite insightful engineering and engineering science-type analyses. They sought me out because of the freeze drying work that I had done. The question was, would I want to come do consulting work with them on a sustained basis, the consulting being in Cincinnati? This would really give them a technological base and a scientific understanding to help them make the decision of whether there should be a Folger's freeze-dried coffee.

That's how we started off. We did a lot of looking at freeze drying. After a few years, after talking with me about my own research and looking into it themselves, [we] came to the conclusion that there were really ways you could take the much cheaper process of spray drying, which costs about one-tenth as much per pound of product as freeze drying does, and improve it to get a product that was comparably good to freeze drying. If so, that would be wonderful, because then the processing costs would be less. The market would be there, because it could compete with freeze drying. We really went down both these roads of a freeze-dried coffee, and improvement to spray drying. I'll get back to that. Then also other products came into the picture as they bought Orange Crush and they bought Ben Hill Griffin Orange Citrus Company, I guess it was, from Florida, and Tetley Tea, I think they bought. The question of freeze drying or spray drying these products came into the picture as well. Plus, as we got more into spray drying, of course they do huge scale spray drying of detergents, and so the drying of those became another part of the consulting.

Audio File 11

11-00:00:02

Redman:

I wanted to make sure that you explained what spray drying is.

11-00:00:20

King:

Yes, I will explain what spray drying is. It's an old process, developed around 1890, that takes a liquid substance, or slurry substance, to be dried, sprays it out through atomizer of some kind. That can either be a porous disc that it goes through under pressure, or a whirling disc that spins drops off the edge, or there are other forms of atomizer. Anyhow, you create a spray out of this material that's to be dried, and it falls through a very large tower. The very large tower has hot air circulating in it, and the heat from the air goes to the drops and causes the evaporation. By the time a drop gets to the bottom, it's a piece of powder. It's solid. That's what spray drying is. That's what two-thirds or so of instant coffee is, and also instant tea, and also powdered milk. Whereas freeze drying holds maybe—I'm not sure of the current numbers—20 to 30 percent of the market on instant coffee.

11-00:01:37

Redman:

If I can break in, you had said that Folgers was interested in investigating spray drying because it would be much cheaper. Why is it cheaper?

11-00:01:48

King:

Spray drying is cheap because all it is is the spray and a whole lot of hot air moving through, and a big tower, and the big tower has no internals other than the nozzle. It's a relatively inexpensive piece of apparatus, even though enormous. A spray dryer could be six stories of a building high. Freeze drying, on the other hand, requires operating with a very low partial pressure of water vapor, well below the triple point pressure of water. The triple point is where the three phases can coexist: vapor, liquid, and solid. Therefore, less than four point six millimeters of mercury for the partial pressure of water vapor. Then you must be able to get the mass transfer fast enough, and the heat transfer fast enough. The way that usually works out is that the operation is truly under a high level of vacuum to enable the gas phase mass transfer to get the water vapor out to be fast enough. That, however, creates the problem of a very porous dry matrix lying between the source of heat and the ice front within what's freeze drying. A porous dry layer of whatever is a very good insulator. You then have a rate limit on the heat transfer. The way these things are optimized out, and operating conditions picked, it may take you something like five hours of residence time to freeze dry something, whereas spray drying occurs in the time it takes a droplet to fall from the top to the bottom of this big tower. A very much shorter length of time. So freeze drying takes a long time, requires a vacuum, and requires very complicated heat input and heat transfer. That's what leads to the ten times greater cost per unit of product.



11-00:03:59

Redman:

Freeze drying, I would assume, would also necessitate a more highly skilled labor force.

11-00:04:05

King:

It's a much more manual operation. It is batch, whereas a spray drying tower would be continuous. A batch process has got to be loaded, unloaded, typically with the food on trays going in to be freeze dried. It's got to be arranged on the tray. The tray has got to be put in. Do your five hours. Pull it back out. It's a much more labor-intensive process.

11-00:04:37

Redman:

Let's get back to why Proctor & Gamble was interested in investigating spray drying and your role in that.

11-00:04:47

King:

Really Proctor & Gamble came commercially to the conclusion that a better spray-dried product was probably a better road to try to travel down than yet another freeze-dried product. If you look at the dynamics of the industry and how it works, in order to compete using the same kind of freeze-dried product, in order to compete with General Foods and Nestle, it'd be marketing. They would just have to simply do better advertising and better marketing. Yet Proctor & Gamble went into the food business thinking it was their technological capabilities that would be their leg up. They preferred to go a road that used their technological capabilities. They thought that spray drying was probably something that they needed to pursue. We would have many conversations about what you would do in spray drying so as to get better volatiles retention. I realized that the field was relatively un-researched and unknown with regard to how to achieve volatiles retention in spray drying.

That, coupled with one other singular event, which is when a Brazilian student came and joined my group with his own scholarship from Brazil, and therefore the research could be anything. It didn't have to be related to one of my research grants. In our initial conversations, he said, "Why are you doing all this freeze drying? Why aren't you getting into spray drying, which is a much bigger operation?" That joined in my mind with all I had been hearing and doing in my interactions with Proctor & Gamble. Of course, let's put spray drying on the same foundation of knowledge with regard to aroma retention and other properties. Drying rates and so forth. Theo Kieckbusch, who was this Brazilian student, was my first student on spray drying. That really went into a line of research that lasted the rest of my research career. This was, in a sense, interactive with Proctor & Gamble, but not in a way that would produce an intellectual property problem of any kind, or that kind of thing. Really, it was seeing what we were

contending with and talking about better processing approaches at P&G that led me to recognize that something or other was just not understood well enough and would be a good line of research. I would undertake the research nearly always with synthetic solutions of sucrose or maltodextrin and water, whereas they, of course, would be working with orange juice or tea or coffee or milk or what have you. The two fed back and forth very nicely. I was able to learn things from my own research that were very helpful in my consulting work with Proctor & Gamble, but perhaps even more important, I was able to recognize needs and areas of true unknown from the work in Proctor & Gamble and bring it back into my own research and know what I should be trying to do.

11-00:08:32

Redman:

The last I checked, the university didn't build you a six-story tower. I'm curious what types of new equipment you needed to procure in order to do this research.

11-00:08:47

King:

Are we now talking freeze drying or spray drying?

11-00:08:49

Redman:

For spray drying.

11-00:08:50

King:

Spray drying, okay. You are very unlikely to build a six-story high spray dryer in the College of Chemistry. There isn't the room for it. You wouldn't want it anyhow, because it's too inflexible with regard to changing conditions and changing usages. I went down several roads in my research on spray drying. They're all different with regard to apparatus, and they're all different with regard to what they were trying to do. We did build a laboratory spray dryer that was in Room 327, Lewis Hall, for many years, and where we would spray out various solutions and have drying conditions and look at the rates of drying and look at the retention of volatile components at different points. Or, as we started looking at particle morphology, which I'll get into more, looking at the morphology of the particles. Namely the appearance, the extent to which they had expanded, whether they formed bubbles that had been dried or what. So we had a dryer. We also created single-droplet dryers of various kinds. I had a couple of students who used a tower, at the top of which we made drops of a very uniform size, by either of a couple of methods. Those single drops would fall through what was now not a giant dryer, but instead a tube that might have been six inches in diameter, and [the drops would] dry as they came down. We could capture them at various points along the way and see what had happened to them. We could measure the temperatures at various points along the way. This was

not a dryer with any capacity. It was instead a way of just looking at what happened to individual drops.

We did studies of the change in size and shape and appearance of the individual particles, which we knew at the beginning was important for one reason. We later on found its importance for another reason. The original reason was that the bulk density of a product is very, very important in the food industry. If you're going to make a cup of coffee, you're going to use a teaspoon. That better have the right amount of coffee in it. Controlling the bulk density was important, and the bulk density relates totally to this degree of particle expansion or contraction or collapse during drying. We knew that was an important property. I later had a linkage of that issue of particle morphology to the retention of volatile flavor and aroma. The way particles expand upon drying is that they, in effect, boil. They get hot enough so that the water makes a big bubble inside, and that bubble grows until it bursts through the surface. That bubble is going to be full of an equilibrium amount of the volatile components, which, remember, are very much more volatile than water. There's going to be a big chunk of volatiles in each one of these bubbles that breaks through. Therefore there was a very direct tie between the morphology question and the volatiles loss question. I did that line of research.

Towards the end of the spray drying research, I also had another piece of apparatus where we would dry truly a single drop. One drop. We would photograph it as we would dry it. We had gas flowing from the bottom up over this single drop, and so up above the drop, I would put one of the kinds of gas chromatograph detectors, known as an electron capture detector. Since all very volatile substances behave about the same, I used something that you will never find in a food product, which was sulfur hexafluoride. The six fluorines in sulfur hexafluoride, the electron capture detector is very sensitive to those six fluorines. It's first of all sensitive to halogens, and secondly, six of them, wow. You could actually view this droplet changing size and doing this and that, and put together with it the response of the electron capture detector up above, and you would see bursts of volatiles come out, and how much was in the volatiles and so forth. That's one I liked greatly. That was one of my very last theses. It was one of the things that made it an unhappy event to give up research at the point where I did in my career. Again, that one was aimed at understanding how morphology would affect the loss and release of these volatile components.

Then we also had work on stickiness related to spray drying powders. This would be whether the product was free-flowing or would stick together. The explanation there was, again, the issue of the viscosity of what was left behind after the water had gone away.

11-00:14:39

Rubens:

How was this equipment being financed?

11-00:14:43

King:

That work on spray drying was by a series of about five National Science Foundation grants. They provided me the support for the graduate students, the money required to get the equipment fabricated, whatever supplies and expense we needed.

11-00:15:05

Redman:

You had said that your own research in spray drying was, in some sense, inspired by the questions you were being asked in your consulting work. Did that continue? As you continued to do consulting work on similar topics, did you feel that you were introduced to new problems that you then brought back to your lab?

11-00:15:30

King:

Never as much as was the case for the freeze drying, spray drying issues with Proctor & Gamble. That was really the one that fed my research the most, and maybe because it lasted the longest. That consulting relationship went a good twenty years. It was long enough so that I would watch the same issues come around again and again and again with the current employees of P&G not realizing that they had addressed this eight years before. That was kind of interesting that way. That gave me the opportunity to stick with it long enough and to build up enough of a backlog of knowledge in the industrial aspects of spray drying and freeze drying. That sort of gave me a library of industrial challenges and needs, and then as I was devising my own research, I could draw on that library and see what in it might be a driver to a particular form of research.

11-00:16:38

Redman:

I'm also interested in getting some sort of shortlist from you of the types of instrumentation that you were using in, in particular, your spray drying research. Also, how the organization of this instrumentation—for instance, when you would have a small droplet tower, were probes inserted in that that were permanent? Did you have a way of entering into the system? I'm curious as to how you were able to actually measure the system.

11-00:17:24

King:

There were several different types of measurement. If you want to measure how dry a spray-dried product is, or an intermediary captured partway down the dryer, you do it by capturing it. You do a very simple test of weighing it, and then stick it in an oven, dry the bejeebers out of it, and then weight it again. That tells you how much water was in the sample that you captured. With regard to these volatile compounds, I was generally capturing samples and would analyze them with a gas chromatograph in order to just detect the peak

corresponding to whatever it was that we were looking at. Then as we came forward to the single droplet dryer, [with] the suspended droplet held in place, I didn't even need the chromatograph. I just simply put the detector of the chromatograph, the electron capture detector, up above it. With regard to stickiness, you could measure the bulk density. You could measure whether it was in fact free-flowing or not. There's usually a pretty sharp change in conditions between a free-flowing powder and one that tends to stick up. It either does or it doesn't. So, which was it when I captured a sample?

Other types of apparatus. The apparatus was all made in the College of Chemistry shops. It was another good example of where those shops were extremely useful for something. My apparatus, and everybody else's apparatus, would be one of a kind. No need to make a second or third or a fourth like it. The shop people were very capable at figuring out how to build something with particular requirements on what it should be.

11-00:19:24

Redman:

I assume that there were distinct shops. You had talked about the glass blowing shop, I suppose. Was there an instrument shop and then—

11-00:19:35

King:

There was an electronics shop, which would do instrumentation and could rig new, specially designed instrumentation. I did get some of that. Then there was a machine shop, which would be what I would use for something like the pieces of the big spray drying column that had to be specially made. Although I think the column itself was made out of something like oil drums.

11-00:20:08

Redman:

You've spoken about your research in freeze drying and in spray drying. Were there any other major research projects that you oversaw?

11-00:20:18

King:

Yes. I had another whole line of research.

11-00:20:21

Rubens:

Could I just ask one question before we move to that? Unless it's connected to Proctor & Gamble.

11-00:20:28

King:

Anything that's food or spray or freeze [drying], we should finish up before we go to the other lines of research.

11-00:20:34

Rubens:

I just wanted to ask you if Proctor & Gamble was a good company to work for.

11-00:20:37

King:

Oh, it was wonderful. Yes. It was wonderful. They had [many] consultants. There was no complication in the consulting relationship. The way this went, particularly as I got into more and more complicated administration, was, well, we'd like you to come sometime within the next two months. What will work for you? I could pick the dates and I could go. The people there generally had the lingo and good understanding. I couldn't design a better consulting relationship than that one.

11-00:21:19

Rubens:

Did you actually visit, look over, Folger plants?

11-00:21:26

King:

I did go to a few plants, yes. I remember a trip to Sherman, Texas, which is north of Dallas, to look at both spray dryers and a decaffeination plant. That was another area I got into with Proctor & Gamble, was decaffeination. That's done by entirely different technology, extraction or absorption.

11-00:21:53

Rubens:

The Folgers plant in San Francisco—

11-00:21:55

King:

Yes, I've been there. I used to take student groups there. It's now gone. As you drove down south to the airport, you could look over to the left at Grand Avenue, I think is the exit, in South San Francisco, and here would be this big, tall building. The big, tall part of it was the spray dryer. It isn't there anymore.

11-00:22:19

Rubens:

Was that the sign "Good to the last drop"?

11-00:22:23

King:

No, that's Maxwell House.

11-00:22:38

Redman:

You were beginning to talk about your other major lines of research.

11-00:22:42

King:

This was even more in line with my broad interest in separations. It was more conventional and more widely used methods of separation. I had a line of research that began with the Environmental Protection Agency [EPA]. One of their laboratories had come to John Prausnitz and to me to try to get research on removal of what were then called priority pollutants. In its early days, EPA had identified some hundred or so priority pollutants that should most be worked on.

11-00:23:31

Redman:

Around what year was this?

11-00:23:34

King:

Early 1970s. The EPA laboratory that came to us was the Robert S. Kerr Laboratory of Ada, Oklahoma. Going to Ada is an event. You fly into Oklahoma City and then you drive for about two and a half hours. It's in sort of south-central Oklahoma. It is in fact the hometown of Senator Robert S. Kerr, who was such a big figure in the U.S. Senate for many years. When you go to this laboratory, you drive up Kerr Laboratory Road. It is of course called the Kerr Laboratory. You first come to the Kerr birthplace to your left, and then you come to the Kerr grave to your right, and then you come to the Kerr Laboratory. So this laboratory must have been built on land that he owned or his family owned. Very much an example of something that was planted there at the request of Senator Kerr at some time. Here was this laboratory, and it was looking for good things to do. I guess it had gotten on to Prausnitz because of his work on thermodynamics and phase equilibrium, but what they came to him on, the questions pertained more to me than to him. The sort of thing I would do. So we had a project with them, and then I had projects with them on solvent extraction of a variety of pollutants, or possible pollutants, out of water, and what was at play there.

Then at the same time, the U.S. was getting into the fossil energy problems, the Arab oil embargo of the early 1970s. This led to the Department of Energy being interested in synthetic fuels, which would be liquefied coal, or gasified coal, or liquefied oil shale, and the processing associated with that. All of that processing produced wastewater streams full of these pollutants and other pollutants. This was how I got back into research with the Lawrence Berkeley Laboratory, going to the Department of Energy for sponsorship of research on removing phenols from water, [as well as] various other things that would show up in these fossil fuel plants. The synthetic fuel effort ended rather abruptly as the energy situation of the U.S. changed, the Arab oil embargo was no longer as important, and the administration also changed to the Reagan administration. That research of mine then went into an office of the Department of Energy known as the Office of Industrial Research. I continued various types of research on removing substances from aqueous streams by solvent extraction.

Then, as another part of that line of research, in the 1980s came along CPC International, which you would [have] known as Corn Products [Corporation], which was a big processor of starch and chemicals from starch, located in Argo, Illinois. Of course, Argo was their brand of starch. Morris Danzig who was the director of research for them, hit upon me and had an initiative to try to just develop general research sponsorship and consulting relationships with three or four people they thought were very good around the U.S. Danzig comes to me and

wants a combination of consulting and their sponsored research, which led me very directly into these issues of how does one avoid conflict of interest, how do you report having research sponsorship from somebody you consult with, et cetera, et cetera. It was a living example of that. I did work with them on removing substances—I think it was carboxylic acids—from aqueous solutions using activated carbon. They were very interested in activated carbon. I then went from the activated carbon to synthetic polymer, solid adsorbents, or absorbents, depending on whether they actually imbibed to the solute, and carried on a line of research there.

Excuse me. I now remember what the solute was with CPC International. It was carboxylic acids, which of course are a product of starch processing. That led me into a line of studying the removal of carboxylic acids from aqueous solution. We moved from the carbon to chemically complexing solvents and absorbents, where the solvent or absorbent would be a base, like an amine. That would either be a high molecular weight organic solvent or it would be an amine-bearing synthetic polymer. You would use the amine to take up the carboxylic acid, acid-base interaction, and then change conditions in some way so as to regenerate the carboxylic acid back off of the sorbent or the extractant. That I did quite a long line of research on. The sponsors of that, in order, were the Environmental Protection Agency first, the Department of Energy all along, and then CPC International for a period of about three years, four years, in the 1980s.

11-00:30:52

Rubens:

This is a naïve science question. What was CPC?

11-00:30:58

King:

Corn Products Corporation.

11-00:31:01

Rubens:

The end result had to do with synthetic fuel?

11-00:31:05

King:

No, no, no. Corn Products is all starch and starch products. One of the big starch products is what is called high fructose corn syrup. They were making a string of products out of starch, in effect. Then some competition arose in an interesting way with Cargill Corporation, which is one of the largest, perhaps the single largest, privately held company in the U.S. They were interested in production of lactic acid. The reason for that is that lactic acid can very easily be turned into a polymer, and that polymer is biodegradable. Many water bottles that you will find nowadays are made of lactate polymers. The idea is if somebody slings them by the side of the road, they will eventually degrade. It was a very attractive product. I had some interactions with Cargill, that is for not pay and was also in a situation where they were



developing processes as I was doing the research, so I had another form of competition going there to sustain our own thinking.

11-00:32:36

Redman:

It seems to me that [for] some of the research that you were doing, the EPA and the Department of Energy in particular, would also be interested in non-aqueous solutions. Were you ever asked to do research in non-aqueous solutions or was that just your specialty, that's what you did?

11-00:33:00

King:

No. I stuck with the aqueous, by and large, and there are several reasons for that. One is that if you're going to do solvent extraction, yes, there are ways of having all kinds of phases that are immiscible with one another, but somehow you've got to have two immiscible phases to do solvent extraction. That means one is aqueous and one is organic, so I should either be taking things out of an aqueous phase into an organic phase, or I should be taking things out of an organic phase into an aqueous phase. The latter is much less often useful. It made more sense to stay in the direction of extracting from aqueous into organic. With regard to the polymers, many of them would have some solubility in an organic phase. They don't have solubility in an aqueous phase. So adsorption from the aqueous phase is more viable.

11-00:34:12

Redman:

You had said that with CPC International, you had to firsthand deal with the problem of being both a consultant and a recipient of research funding. How did you manage that?

11-00:34:27

King:

We actually had some rules at the time.

11-00:34:29

Redman:

At Berkeley?

11-00:34:31

King:

At Berkeley, yes. In that I was going to get research support from a company that I also consulted with, I had to fill out forms for a committee that would review that for the campus and say whether or not it was okay for me to take the research support. The second thing I had to be very careful to avoid would be somehow using the facilities and laboratories of the university for research that was in fact corporate research rather than my own line of academic research. So I was careful about that. I've had a history, and we should maybe spend a session on it, of dealing with this issue of industry-university relations and connections. It goes all the way back to where a company was being formed by people from within the chemical engineering department, and I was the department chair. When I was department chair, we had a company being formed within the department. A lot

going forth from there. We should do that as a separate session, I think.

11-00:35:53

Redman:

You have a laundry list of companies and organizations that you've consulted for. We can certainly add that list as an appendix. Proctor & Gamble clearly was an important client of yours. What other examples were important?

11-00:36:12

King:

Let's take the long-term ones. Most of that list is single-shot things where somebody came to me for one visit on something or other. Some others that had some continuity to them—one was with an Italian company, Samprogetti, which is a big chemical company in Italy. I did this all by what was mail at the time. I would be sent a problem. Here was their need, here was what they're working on. What did I have to say about it? What could I contribute? I then would write a long thing on what I had to say about it and send it back to them. That went on for a number of years, and mostly had to do with standard petrochemical processes, which was the bread and butter of their business, and therefore core standard separations, like distillation or absorption and extractions. That was a bit of practical experience that would reinforce those very core aspects of my book.

Another one that lasted some time was with what had been Cutter Laboratories here in Berkeley, which now is Bayer. I have to remember which pronounces it which way. I think it's "Bayer" with a short a in Germany and "Bayer" with a long a in the U.S. Spelled the same and it's the same company. This is down in lower Berkeley, towards Emeryville, and is a production plant. They had freeze drying. It was of pharmaceutical products. Blood products. Cutter's original business was fractionation of blood into various products. They needed to stabilize them. This was very largely a freeze drying consulting job. I had others that related to freeze drying and would be typically pharmaceutical companies.

11-00:38:15

Redman:

Generally in this area?

11-00:38:18

King:

All around the U.S. I've forgotten whether Merck is on the list, but I certainly did visit and work with Merck [in New Jersey] for a while. The typical problem was how to avoid collapse in freeze drying. How to get a product that remained porous and was stable and nice to rehydrate and easy to rehydrate, rather than just being a glob.

11-00:38:48

Redman:

In terms of your role as consultant and problem solving—let's take this example of collapse—how theoretical was your solution and how dependent on the particular substance that they were using was it?

11-00:39:13

King:

It is dependent on the substance, but the concept is general. As you freeze dry something, you leave behind this dry, porous matrix. The pores are where the ice crystals were. You froze it. The ice crystals formed crystals in between webs of something else. You sublime away the ice. The webs are left. Are these webs going to have a sufficiently high viscosity so that they will not flow and close off the small dimensions of the pore? You're talking about very high viscosities, very short dimensions of flow, and small pores. The concept is general. If you meet a new problem and a new need, you ask yourself immediately, what is going to affect the viscosity of this supposedly dry stuff that is left in between the pores where the ice crystals were? You start thinking about what it is that's being dried and what its properties and its flow properties are likely to be, and then resort back to this simple model of the viscosity determining the amount of flow and apply it forward to the situation at hand. The answer might be to dry it at a lower temperature. The answer might be that you're trying to dry something that is going to be horrible because it can't get high enough in viscosity, so you'd better put in something—these are occasionally called emollients—to make it more viscous and help it dry. What might that substance be? It will be inert with regard to whatever is the application of your product. That would be the kind of thinking.

11-00:41:15

Rubens:

Was Merck around the same time as the Cutter Labs?

11-00:41:21

King:

I'd have to look. It's also possible I went to Merck and didn't get paid, and therefore didn't put it down. It was paid consulting that I would put down.

11-00:41:38

Redman:

This consulting, in that it was all over the place, I assume involved some travel?

11-00:41:43

King:

It involved a lot of travel. There's the King rule of consultancies, which is that in order to be valuable, a consultant must have come from at least 2,000 miles away. If they're next door, they're not interesting to the company. I never consulted for Chevron or Stauffer.

11-00:42:05

Redman:

Are there any other consulting jobs that were particularly important?

11-00:42:10

King: I'd have to look at the list.

11-00:42:11

Rubens: There's Lockheed Missiles.

11-00:42:13

King: Yes, I remember that one. The Lockheed Missiles one was a bit different. They came to me, and I think again they found me as a process-like person. Lockheed is an aircraft company. It was doing very early work on the disposal of waste products from manned spacecraft. This might be human waste or it might be other kinds of waste. The process they were using was something called wet air oxidation, which means having it in a moist, wet, watery environment, contacting oxygen with it, and you're going to oxidize the material and turn it into a gas so it will go away. You actually have a combination of a high enough temperature and other forms of the environment to enable this oxidation to happen and the products go away. They came to me. I was not particularly an expert on wet air oxidation. I think that was through having a reputation as one of the few process-type people in chem-engineering at Berkeley. So they got me.

11-00:43:32

Rubens: I had meant to ask yesterday when you were talking about the uses of freeze-dried food—we were talking about backpackers. It crossed my mind about NASA.

11-00:43:42

King: Yes, NASA. I never worked for NASA on this that I can recall, but definitely they use and are interested in freeze-dried foods.

11-00:43:53

Rubens: Lockheed Missiles is Lockheed Martin?

11-00:43:56

King: Yes. It is now Lockheed Martin. Lockheed was a separate company, Martin was a separate company, and they merged.

11-00:44:11

Rubens: There was the Alza Corp.

11-00:44:13

King: Yes, that's an interesting one. That's Alan Michaels. Alan Michaels I have mentioned before, I believe, because he was one of the young professors at MIT when I was a graduate student and had research grants, and therefore a lot of coworkers. I think that came into the conversation. Alan Michaels was one of the very early ones to form his own company. He had a company called Amicon, Alan Michaels Consultants. Turned into just Amicon. Amicon worked on membrane separations. Alan Michaels was one of the pioneers of membrane

separations. In my day at MIT, he was doing such things as soaking polyethylene membranes in different xylene isomers—ortho, meta, or paraxylene—with the hopes that by then vaporizing the xylene out of the polymeric membrane, he would leave a hole that was just the size of that molecule and could pass only that molecule and things that were smaller rather than larger molecules. That was going to be a way of separating xylene isomers, which have size differences.

Alan had formed Amicon. I did work with Amicon while I was in Cambridge to do some consulting. That was not my earliest consulting. I know what my earliest consulting was. But it was early consulting. The earliest was a gas pipeline explosion in Charlestown, Massachusetts, and to try to diagnose what had caused the explosion. That was work for a lawyer. Michaels had his own company and I had consulted with it. Actually, a piece of work that I felt very good about was done in connection with Amicon. It was not published. It was an original explanation of what causes the buildup of foulants on membrane surfaces, which cut off the flux through the membrane, meaning the rate of a separation goes down.

Alan Michaels moved from Massachusetts to California about when we did. He had another company, Pharmetrics, which he had founded and which he was funded in by Alejandro Zaffaroni—Alza. Alejandro Zaffaroni had his own company, Alza Corporation, which was looking at the novel forms of engineered delivery of drugs to the body. Such things as the skin patch that would deliver something that caused you no longer to want nicotine if you wanted to go off smoking, or something that would deliver L-Dopa to a Parkinson's patient. Michaels had his own company and had a research relation, I think a corporate tie, actually, with Alza. After two or three years, Pharmetrics got subsumed into Alza. So I consulted for all three, Amicon, Pharmetrics, and Alza, as they morphed along in what they were. Generally, that was because I had a good relationship with Alan Michaels. Of the people I have known over the years, he was remarkable. He was somebody who would fire out ideas right and left, a remarkably high percentage of them being good ideas, which means 25 percent, not 100 percent. I think he valued me as somebody he could bounce something off and get a fairly quick reaction as to what the engineering sense or nonsense of it would be. So get a quick feedback as to whether it was a good idea or not.

Just to remark, the one other person in my life I have known like that, who would bounce out ideas right and left, with a remarkably high percentage of them being good, was Richard Atkinson, under very different circumstances.

11-00:49:28

Rubens:

Slightly out of tune. You said, regarding what's lost in now doing calculations through computer programs—would you mind just iterating—

11-00:49:50

King:

Yes. We'll take distillation as an example. There were various ways of calculating distillation when one did it by hand. You may remember I talked about a summer job in Pullman Kellogg, where I did a distillation calculation for weeks at a time. That was the old way with calculators. In order to devise those methods of calculation, you had to have a physical sense of what this particular processing equipment was like and what it did. Devising the computation method related a lot to your physical understanding of the process. What I believe has been lost over the years is that you now do distillation [calculations] by just simply pulling in a program from Aspen Technology or somewhere and saying, calculate, feeding its input, get back its output in five seconds. What you've lost is the ability to understand the physics of what's going on as well as you would have if you had devised your own calculation method.

It's not unlike what's lost by having gone from the slide rule to the computer. I started off with the slide rule. I still have my slide rule in a drawer. With a slide rule, you had to do an order of magnitude calculation at the same time. Do this back and forth to get the numbers right, and you'd have an answer that was three five seven. That's nice. Is that three point five seven? Thirty-five point seven? Zero point three five seven? The way to answer that was to have done a rough calculation at the same time. If you're going to multiply four point six seven by two point five nine, you say, that's close to five times two and a half, which is whatever it is. Twelve and a half. That order of magnitude calculation ability is lost. When we got to students who used only calculators or only computers and not slide rules, you could very easily get somebody to do a calculation on a test and end up with an answer that made no sense at all, such as the distance from Berkeley to San Francisco being point oh two five miles or something like that.

11-00:52:31

Redman:

This is probably a foreshadowing question. Would you say that this problem is in part due to the increasing emphasis on specialization and education, in higher education at least?

11-00:52:47

King:

It's due to that, and it is also due to the fact that being able to do a distillation calculation in five seconds, rather than three weeks, is a great efficiency gained. In a sense, it's enabling, because now you can concentrate on higher levels of thinking having to do with process

design or process analysis, rather than this distillation calculation. There are great advantages that come from it.

11-00:53:20

Rubens:

What was your proposal for what the [Proctor & Gamble] Sacramento plant should amend?

11-00:53:33

King:

Oxo alcohols is what I proposed. The oxo process was a way of making alcohols from particular feed stocks. I think the plant had been for fatty acid separation and production. They were shutting it down. The oxo alcohol idea was to get a product, namely alcohol. It would not be unlike Proctor & Gamble. It would be a sensible product from them. The materials would have to come from wherever they came by a water route. You can get mighty close to their Sacramento plant by water. It was thinking of that sort.

11-00:54:18

Rubens:

This they did not—

11-00:54:20

King:

They did not build an oxo alcohol plant, but it intrigued them.

Well, let me mention another line of research very early on, which related to the idea of having come to Berkeley being challenged and charged to start up efforts for the department in process design and process analysis. I did have some early projects on systematic process synthesis. The logic of putting together processes. Indeed, my work with Paco Barnés, the one who became Rector of the National University of Mexico, his master's thesis related to that. So did some other projects at the time. I never got far in that line of research, and I think what turned me off of it was that in order to go further, it seemed that the path of progress was very theoretical, almost field of mathematics-type thinking, in order to go further with it. There were people at the time who had done what was called heuristic synthesis in other areas, including a man named Fritz Zwicky, who I think had been an astronomer at Cal Tech. He had books on this subject. What I was trying to do was identify the rules of the game with regard to what you should think about in putting together chemical processes. Some of that survived into the process selection and sequencing chapter of my separation processes book. That was one other line of research that stopped rather early on, simply because I didn't think that it was using my talents best, or maybe it wasn't concrete enough for me to be able to think and see where it was going.

Interview 6: May 25, 2011

Audio File 12

12-00:00:01

Redman: In our last meeting, we talked about some of your consulting work. I'd like to continue with that. We might be moving around a bit chronologically, but let's stick with the work you've done before 1981. You had said last week that there were sort of a few representative examples. Let's start with Marine Colloids in Rockland, Maine. You consulted there from 1973 to '76, and if I understand correctly, the work done at this company involves the production of carrageenan?

12-00:00:48

King: Carrageenan. Read your ice cream label. Carrageenan will be on it.

12-00:00:54

Redman: Can you first explain how you became involved with this?

12-00:00:57

King: Sure. That was a personal contact. A very good friend of mine during graduate school days at MIT, whom I've kept up with ever since, is a man named Harris Bixler, or Pete Bixler. Pete had become technical director of Marine Colloids. He was later president of Marine Colloids. Although not a well-known company, it is the company in the U.S. for processing red seaweed into carrageenan, which is a thickening agent that, among other things, is heavily used in ice cream. That was the processing that was going on there. It was an example of where my having worked on the edge of chemical engineering applications in the food industry was a useful thing, because, yes, there was drying. There was no freeze drying, but there was drying, and there were various other processing steps that an ordinary chemical engineer would probably not have gotten into. I did go there repeatedly. It was an interesting airplane trip. You went from Logan Airport to Camden, Maine, I think it is, on Down East Airlines. I, being larger than the other passengers, was usually picked to sit in the copilot seat. This does not deal with the question of what happens if something does happen to the pilot and I'm supposed to do something, but nonetheless, several times, I flew copilot up to Camden, Maine. It was rewarding consulting. It was different. The particular processing had not been penetrated much by chemical engineers. Again, you work on something, it's a little different from what others do, and you find you can contribute.

12-00:02:58

Redman: What kinds of questions were you asked to consult about?



12-00:03:05

King:

Sticking or agglomeration of the product. There, the knowledge of what causes stickiness in freeze drying and spray drying was useful to me to draw on to try to address those things. Ways of accelerating the process so as to make for a larger throughput on the machinery. [The] Question of where the process limits would lie. Those sorts of things.

12-00:03:36

Redman:

Were you conducting any research back at Berkeley?

12-00:03:40

King:

No, I did not. In fact, none of my consulting tied that closely to research, except for the extensive tie in the Proctor & Gamble consulting that we discussed last time.

12-00:03:53

Redman:

I'm just curious. I had read that this Marine Colloids Corporation dealt with locally sourced seaweed. Is this why it was located in Maine?

12-00:04:05

King:

Yes, I think the original site did have to do with sources of seaweed. However, when I was involved with it, their principal source was the Philippines, which doesn't have much to do with location.

12-00:04:20

Redman:

Soon after beginning to work with Marine Colloids, you began consulting for Kennecott Copper. This is primarily a mining company, but you provided consulting at their Ledgemont Laboratory in Massachusetts?

12-00:04:34

King:

Yes. That's sort of a phase of industry, and a rather interesting one. Kennecott is a very old copper company. In fact, on a vacation trip a few years ago, Jeanne and I were on a tour that went to the original site of Kennecott, which is adjoining the Kennicott Glacier up in Alaska and what is now Wrangell-St. Elias National Park. There they originally would take 95 per cent of the copper out by pack horses to Valdez, but when the dedicated railway was built it went to Cordova. Then they'd be transported to the U.S. That was a huge operation back in the 1800s. Kennecott grew and became a very large copper company. It has such things as the large, open pit in Utah, across from Salt Lake City. It was, I would say, at the forefront of mineral mining and processing techniques, but had not been all that much into research. So the decision was made a few years before I started this assignment to have a corporate research laboratory. They acquired what had been an old estate, possibly a college or a very large school—I'm not sure what it had been—in Lexington, Massachusetts, and turned this entirely into a corporate research laboratory,

surrounded by grassy grounds, of the sort you would associate with much more rural corporate research laboratories.

A man named Al Servi had been named the director of that laboratory. Exactly how he found me, I don't recall well. But he did, and they came to me and asked if I would be interested in just being an ongoing consultant with them. So yes, I did. It was on a variety of issues. It was whatever had come up all around the laboratory. There was no single core topic to the consulting. The interesting thing then was that as my time with them ended, the decision was then made at the corporate level not to have this laboratory. My time with them was rather coincident with the rather short heyday of the laboratory. It's interesting. The metals industry is not known for having large corporate research laboratories, so this was quite an innovation at the time. I think it may have been a metals industry relative of what Proctor & Gamble was to the food and cosmetic industry. Namely, trying to use technical insight and expertise to come up with products that were better than what the competitors would be on the market. This was clearly what Kennecott was trying to do, too.

12-00:07:43

Redman:

When you say products, what kind of products are we talking about? Just simply—

12-00:07:48

King:

Copper. I'm talking about copper, yes. Metallic copper. It was not a matter of taking the copper and doing something with it. It was taking copper ore and getting the metallic copper out of the ore. Now, that's a very large separations issue. There's another interesting story here. The richness of copper ores has declined over the years. The really rich sources had been used up. Over the last hundred years, the percent copper in the ores that are used for the refining has gone down and down and down. You would be using techniques where you would be getting, say, 1 percent of the ore as your copper product. That calls for very different processing from what it would be for very rich ores. There's another part of that story that's interesting, too, which is the U.S. has been put largely out of the copper business now because richer ores have been found in other countries. Africa and China, I believe.

12-00:09:10

Redman:

It's your understanding that you were asked to serve as a consultant because of your notoriety in separation techniques?

12-00:09:19

King:

I think it was my general knowledge of separations that was the reason. Because if there was a common denominator to all of this, it was separations of one kind or another.

12-00:09:35

Redman:

You also provided consulting for the Merix Corporation.

12-00:09:38

King:

Yes. The greatest number of employees it ever had was two. It was the personal company of Tom Mix, who had been my Practice School director when I was a student in the Oak Ridge Practice School. Again, this was after I had written my book. What Tom Mix was doing in his company had everything to do with distillation. Ways of designing distillation towers, ways of designing better distillation plates and so forth. He would then get patents on various approaches and market them to larger companies who would use the patents. That, again, was a result of my having learned a lot about distillation as I had put my book together.

12-00:10:36

Redman:

How long were you involved with that?

12-00:10:38

King:

I don't remember well. I would say maybe over about three or four years.

12-00:10:50

Redman:

Was there a product created from Merix?

12-00:10:53

King:

No. The product would be design know-how. Patents that Tom would then be able to market. There are many ways of building a distillation plate, but generally they have perforations of some kind, plus devices to hold the liquid back on the plate. The vapor phase will then muddle or froth through the liquid phase. The trick is to get good, intimate contacting so that you can get near equilibrium between the vapor and the liquid on a given tray. Among the things you want to do are to have that very intimate contact with the phases to equilibrate well, but also hold the liquid on the tray, not flood the column with the up-flowing vapor preventing the liquid from flowing down. There are lots of things to be satisfied simultaneously in the design of a distillation tray. There have been lots of successful designs over the years.

12-00:11:59

Redman:

This work was actually very similar to the work that you yourself did at the Practice School, is that correct?

12-00:12:05

King:

No, not really, because the Oak Ridge Practice School—that was a variety of different, rather fundamental research projects that we did there. It certainly had relation to what I did at the Esso Bayway Practice School, because an oil refinery is full of distillation columns. Distillation there, distillation in the book, and distillation with Merix.

12-00:12:34

Redman:

Again, you had a personal connection, but also your general knowledge of separation—

12-00:12:41

King:

Yes.

12-00:12:41

Redman:

—techniques in general is why you were asked. This is somewhat of a difficult question. At the time, were you the separations expert?

12-00:12:56

King:

I don't know whether I was the separations expert. There were a lot of other people in the field. The one compliment I've been paid along that line was by the gentleman from Monterey whom I mentioned earlier [the officer from the Naval Postgraduate School] who proclaimed that I was Mr. Freeze Drying of the Western world. That mantle I'll wear. Distillation, I think I have to share the mantle with other people.

12-00:13:19

Rubens:

You were with Merix for five years. That's substantial.

12-00:13:26

King:

Yes. It would be like an annual visit.

12-00:13:29

Rubens:

I was going to ask how often it was. Could you combine that when you were going to Maine, or were these all separate trips?

12-00:13:38

King:

The answers are variable on that. I would try to put trips together, because that plane ride cross-country is long. Then there does seem to be a rule of consulting that you're attractive only if you're a few thousand miles away. Much of the consulting did involve cross-country travel. That trip has never gotten shorter. Therefore, putting things together was very desirable. The problem any academic has, though, you do have a teaching schedule, and your trip can't be that long or you will have not done well by your class. You balance those things.

12-00:14:26

Redman:

Throughout your career, you've also been actively involved with the American Institute of Chemical Engineers. I'd like to talk about some of your work within this professional organization. In particular, in 1973, you become the chair of AIChE's ad-hoc committee on the expanding domain of chemical engineering, which you had said a little bit about earlier. Sort of looking at where chemical engineering was going, the different uses for it. First, I'm curious, did this committee

form out of what was sort of a changing conception of what chemical engineering was?

12-00:15:08

King:

I think it formed for several reasons. One is that it was a period of time when the utilization of chemical engineers was spreading out beyond just the petroleum and chemical industries, which had been its history. It was clearly a new phenomenon that chemical engineers were starting to do more things. I think it was also a period when the institute recognized that it would be healthy for the profession to take active moves to try to enhance the number of opportunities for chemical engineers, because then chemical engineering was tied so much to the petroleum and chemical industries, you'd have economic ups and downs of that industry, and the employment of chemical engineers would go up and down right in phase with that. To develop more utilization, more different industries that would use chemical engineers, was a stabilizing force with regard to the employment market. And, of course, an expansion for us, too. That particular committee came about because of a man named Ted Weaver, who was an executive of Fluor Corporation and who later was the president of AIChE. My memory is not real good here, but I believe he was in not in the president role, but in the next level down role in AIChE as this committee was formed.

I do not know how he got to me. I had, before that time, done work with the Education Projects Committee of AIChE, and had chaired that committee. Maybe that work impressed somebody. That's a possibility. The other thing that occurs to me in hindsight is that Berkeley has always, in chemical engineering, had their tradition of working to new applications. A very good example was Charles Tobias, who was one of the founders of the department, and who was the department chair that preceded my being department chair. His area was electrochemical engineering. There were very few electrochemical engineers. Charles, in many ways, pioneered that field and built up what it was and had graduates out all over the place, and in companies other than chemical and petroleum. I had mentioned earlier Charlie Wilke being one of the original people in biochemical engineering, too. So Berkeley was known as a place for new applications. Maybe my food industry consulting and research relating to it had something to do with this also.

Ted did come to me, despite my being relatively young. We had a committee that did quite a job, surveying what chemical engineers could do, examining different industries, and came up with a big, long list. It's rather satisfying to have looked back on those thirty years, almost forty years now, later, which I have done. A very large number of the predictions there came true. In that sense, chemical engineering,

over that period of time, may have achieved something like what, oh, say, mechanical engineering has achieved, which is no one small set of industries that employ them. Mechanical engineers are employed everywhere. Well, so it is now for chemical engineers, to a large extent, which I think is a very good thing.

12-00:19:18

Redman:

Would you say that Berkeley's reputation of already looking at a varied use for chemical engineers—is there something special about the department or is it just coincidence that these individuals were together in one place?

12-00:19:36

King:

I think it's two things, and the two things tie together. I think it does relate to having been spawned out of the College of Chemistry. Therefore, the traditional engineering applications were not all that strongly represented in the department. Yes, there were some people in very traditional areas who did very well. LeRoy Bromley, one of the founding faculty members, is a good example of that. I think the tradition of Berkeley chemistry is to look for creativity, innovation, new ways of doing things, and so that was built right into chemical engineering at Berkeley from the start. Then it's the people, too. It did take people like Tobias and Wilke. They were right for it and the setting was right for it, so it worked well in combination.

12-00:20:34

Redman:

Do you recall any of the other committee members?

12-00:20:37

King:

My goodness sake's. Yeah, I recall an executive of Rohm and Haas, named Sumner West, who was my vice chair, I think. He's the coauthor with me of the article in "Chemical Engineering Progress" that reports the work of this committee. I'm going to have trouble remembering more of them. You, of course, have a list of names there that you're about to read off to me.

12-00:21:08

Redman:

No, no.

12-00:21:11

Rubens:

How did you become chair, though? I just want to ask that.

12-00:21:13

King:

I was asked by Ted Weaver. I got a phone call from him.

12-00:21:19

Redman:

I assume that everyone on this committee was spread around. Did working on this committee involve travel, or was the work done by correspondence?

12-00:21:29

King:

Very typical of AIChE committees, there are three national meetings of AIChE a year, so the committee would meet at each meeting, and then would have some meetings in between, the typical place being O'Hare Airport.

12-00:21:50

Redman:

Interesting. In those conference rooms at the airport?

12-00:21:53

King:

The Hilton.

12-00:21:59

Redman:

The final product was not a report. It was published as an article. Is that——

12-00:22:04

King:

I believe there was a report and an article both. The report was strictly internal. The article came later.

12-00:22:17

Redman:

Did you find the process to be straightforward or did committee members disagree about where chemical engineering was going?

12-00:22:27

King:

You have to remember that Ted Weaver had a lot to do with the formation of the committee. Ted Weaver believed immensely in a broad domain for chemical engineering, so he put people on the committee who believed in a broad domain of chemical engineering. Therefore, it was more in the vein of, what do chemical engineers know, what can they do, what industry is utilizing them not at all or very little right now? That kind of thinking, rather than anything along the line of, should we go beyond this point, should we stay with the core, or anything like that. So it was a committee that worked pretty synergistically.

12-00:23:15

Rubens:

Just for the record, the article comes out in 1976. It's number eighty-eight on your list. You do it with A.S. West.

12-00:23:24

King:

That's Sumner West. Yes.

12-00:23:28

Redman:

You had mentioned that it was fulfilling to look back and see that these predictions were true, but I——

12-00:23:37

King:

Largely true.

12-00:23:38

Redman:

Largely true. But I'm also interested in which ways this report, this article, had a practical impact. Did it change graduate programs in chemical engineering?

12-00:23:56

King:

No, I don't believe it changed graduate programs. I think they changed in other ways, which I'll comment on. I think it did alert the institute as to what industries it should start targeting with its programming and with its other activities. There's another interesting dynamic at play there, which is that the institute covers all of chemical engineering, and now chemical engineering has so many sub-specialties that the sub-specialties tend to have their own meetings around the world. So there is an issue nowadays of, can the institute keep everything tied together and retain its position with regard to the profession? It helped them to be able to know where it is they should be trying to generate programming in order to keep people tied into the institute.

12-00:25:05

Redman:

I was just going to ask if you thought that, in the time since this report, there have been other sort of fundamental changes in chemical engineering that would require a similar report? But it sounds like you're recommending sort of the opposite committee, and trying to, instead of looking at where chemical engineering can branch out, try to rethink the umbrella.

12-00:25:32

King:

I thought the institute wanted to be there wherever the chemical engineers would be. Trying to bring these people into the institute is sort of a reactionary thing by the institute itself. Once the institute started chemical engineering programming in a particular area, then there would be chemical engineers drawn to it. Anything of this sort, getting more use of chemical engineers or anybody else within an industry, they've got to hire one or two. Those one or two have got to do well. They then will encourage or build confidence in the company hiring more of that profession. There's a chicken and egg thing that has to get going and grow. I think the institute did have a role in that -- the fact that there would be a home for these chemical engineers in brand-new or different areas.

I now remember what it was I wanted to come back to, and that is, with regard to the spread to these other industries, I think another excellent mechanism was the development of research in the universities in those areas. Then a company that needed a particular kind of knowledge or expertise draws a consultant from the university. Then they discover they've got more to be done in this area than this one consultant can do on three annual visits, so do you have some graduates whom you're willing to recommend that could come work



for us? That sort of thing. That is a mechanism for the growth of the utilization of something like chemical engineering in an industrial area.

12-00:27:24

Redman:

Do you think that, at least in part, that came about as a result of your committee's work?

12-00:27:30

King:

In part. There were many other forces at play, too. I think it opened the eyes of the institute. I think you can also look upon that activity and that report as being just a way in which a very foresighted man, Ted Weaver, saw to build activities within the institute that would sort of shake up the institute with regard to its interests and activities. So there was an internal aspect to it as well.

12-00:28:02

Redman:

Assuming that the AIChE offers things like grants or fellowships, did that change how grants and fellowships were distributed?

12-00:28:12

King:

The AIChE does not distribute graduate fellowships. It's strictly a professional society, and dues are used for internal society purposes, not for fellowships. If we look at how it spread in universities and in students, I think a better model would be to recognize that for forty and more years now, most graduate students in chemical engineering and related fields have been supported by research assistantships or from government grants. The source of that funding is the government grant, and that's for a subject. There is a research subject that got proposed to the federal agency in order to get that grant. So it did require recognition by federal agencies that there were things that chemical engineers could do that were different, that were worthwhile enough and promising enough to be funded. There is some building of the applications through that. I would use my own work in food processing as a small example of that. I demonstrated the utility of chemical engineering principles, both the funding agencies, and, for that matter, the American Institute of Chemical Engineers became aware. So AIChE eventually created a division of food, pharmaceutical, and bioengineering to do these things. The National Science Foundation has a division of engineering, and then it has subdivisions on downward to specific programs. There have been programs within NSF bearing the word "food" in the name.

12-00:30:20

Redman:

You were also involved in planning the 1979 annual meeting for AIChE here in San Francisco. If I understand correctly, you were the meeting program chair. How did you come to take on that role?

12-00:30:36

King:

How did I come to take on any role? One could say I have a hard time saying no. But the reason I have a hard time saying no is that so many things are interesting and different and are challenging, and I like challenges, particularly organizational, structural challenges. Make it all work, some big complicated thing. So here was this annual meeting, which I think had something like 140 different sessions in it, on a whole variety of topics. You worked through the program committee of the institute to get people who will be the chairs and organizers of each of these sessions. You try to get a balanced program. Then the interesting one towards the end of all of this is you have a hotel, which in my case was actually two hotels. For years, AIChE used the San Francisco Hilton when they hold the meeting here. We had that, and about a quarter of the program in the Hyatt—it must have been the Grand Hyatt, on the other side of Union Square. We put some specialized things over in the Grand Hyatt, and then had all the various rooms in the Hilton. You have to make an educated guess as to which sessions are going to draw what numbers of people and what are conflicting sessions, so keep them all apart. There was quite a puzzle to be solved in how you structure up the program, what session in what room on what day. That kind of thing. It was quite large, and I think the largest attendance AIChE meeting ever at the time, which would have been something like 5,000 people. Which would mean nothing to the American Chemical Society. They're way bigger than that. But for chemical engineering, that was quite large.

12-00:32:39

Redman:

Do you recall who you worked with on this committee?

12-00:32:44

King:

Who worked with me on this meeting? The local AIChE section took on the arrangements planning for the meeting. The tours. Non-program events. So there were people from that section. I'm sure one of them was Emmett Miller, who's been at it for a very long time. He was a career employee at Shell. If you were to tell me the name of the general arrangements chairman, I will of course immediately recognize it, but it's not coming to mind right now.

12-00:33:27

Rubens:

You had been involved in the organization in terms of chairing different positions. You had been chair of the drying division and second vice chair of the food—

12-00:33:46

King:

Yeah, you work your way through the ranks on that. I was second vice, first vice, and then chair of it.

12-00:33:52

Rubens:

I would assume you're calling on people from the divisions—

12-00:33:58

King:

Yes. There's a lot of organizing across the nation on this, yes. If you're a program chair, you then are the one who's going to have to proffer the names of these session chairs forward to the technical program chair of the meeting itself. So, yes, there's a lot of contacts, knowing people, knowing who is right for what topic, knowing who will do a good job as an organizer, who might not. All of that sort of thing. Not unlike what it takes to be chair of a department or a dean.

12-00:34:41

Redman:

Would you say that the way in which you structured the meeting was different than previous meetings?

12-00:34:52

King:

I know I had a large number of simultaneous sessions, and that's because the number of sessions, I think, also was an increase over those from previous years. This was relatively soon after the expanding domain report, so a natural thing to do was to concentrate on some of these newer areas. I probably gave more attention to them than had been the case in the past. That's probably the principal innovation.

12-00:35:36

Redman:

I'm sure that you faced a number of difficulties in trying to put together such a large-scale meeting. Are there any obstacles or problems that stick out as being particularly difficult to deal with?

12-00:35:49

King:

I do remember having 130 or so index cards with the name and subject of each session on them, and arraying them on the living room floor as a way of trying to look at all the combinations and permutations as to how the program might be put together. This was, again, looking at what would conflict with what, what were natural successors in the same room, et cetera. It was an interesting combinatorial problem that of course would be no difficulty whatsoever today because we have computers.

12-00:36:21

Redman:

I'm not sure I'd say no difficulty. I'm just curious, if you had to estimate how many hours you worked on this?

12-00:36:37

King:

That's a hard estimate for me to do because my way of working has always been everything in together. I may have thirteen different things that are pressing on me, and I turn from one to the other and back and forth. If I'm stuck on something or I want to think a little more, I just let that be in the back of my head and then turn to the next subject. But for that, and this was 1979, so it was late in my chairmanship of the chemical engineering department, I would guess

that that meeting probably took three solid months work. Something like that.

12-00:37:28

Rubens:

I vaguely remember an OAH, Organization of American Historians, convention out here around that time. They had a lot of trouble with the effort to unionize hotels. They had to switch location. Did you encounter that?

12-00:37:44

King:

No, we did not have that problem. I do remember a time when an American Chemical Society meeting got switched to Las Vegas about two weeks before the meeting because of this kind of thing. It was unions. But we had no problem of that sort.

12-00:38:03

Redman:

I'm assuming that you enjoyed this problem-solving.

12-00:38:08

King:

Yes, I did. That explains me, I think, to a large degree, is that I actually do like to do these things.

12-00:38:25

Redman:

You also, with AIChE, were involved—I wasn't sure at what time, and I take it that I'm out of chronological order—you were involved with a committee on case problems in education.

12-00:38:37

King:

Oh, that was way early on.

12-00:38:39

Redman:

When was that?

12-00:38:41

King:

That relates to the charge that I had as I came to Berkeley to try to create a design and process-oriented portion of the curriculum. I think I mentioned when we talked about that that we created a number of case problems. So did Scott Lynn, who came to work with me on this. It was my time on the Education Projects Committee of AIChE that a fellow named Don Woods from McMaster in Canada was also on that committee. He was a creator of other things like case problems, and particularly in his case, troubleshooting problems. We got together on this. One of the projects of the Education Projects Committee was to assemble case problems. I believe my first National Science Foundation grant was not for research. It was for creating case problems. So we had an NSF-funded project to put these case problems together. I think we used AIChE as our publisher once we had done these problems. That all fit together. That was a very interesting exercise. Case problems keep getting rediscovered as the

years go on. Various adherents come to make them and use them. It's never taken over as a method of education, but it's one I like a lot.

12-00:40:36

Redman: What position did you hold on this committee?

12-00:40:41

King: On the Education Projects Committee? I chaired it for several years.

12-00:40:46

Redman: About how large was the committee? You mentioned Don Woods, but—

12-00:40:49

King: It was probably about twelve people.

12-00:40:51

Redman: Again, was this a committee that met generally at AIChE?

12-00:40:54

King: Yeah, met always at AIChE meetings.

12-00:40:59

Redman: About how long did you work on this committee and on this project?

12-00:41:07

King: The case problems, we worked on heavily during the sixties and maybe a little bit into the seventies. That doesn't coincide with my service on the committee. I don't remember the exact dates on the committee, other than the fact that it was my first AIChE committee. I did chair it before too long.

12-00:41:32

Redman: What was the ultimate product? Was it a book?

12-00:41:37

King: Yes. It's a paperbound book, eight-and-a-half by eleven. Probably 100 or 120 pages, with about eight case problems in it.

12-00:41:51

Redman: Was this used as a textbook or was it used for practical purposes?

12-00:41:57

King: No, not as a textbook, because it had the discussion of the answers, too. So what it was was an instructor's handbook, effectively. It could be gotten through AIChE.

12-00:42:11

Redman: Do you have a sense of how widely it was used?

12-00:42:14

King: I know a lot of people were aware of it. I don't have any quantitative sense of how widely it was used.

12-00:42:20

Redman: But it was fairly well-received?

12-00:42:23

King: Oh, yes.

12-00:42:26

Redman: What practical implications do you think this committee's work had on education?

12-00:42:34

King: I think it generated a few more users of the case problem approach at the time. As I say, case problems have never come to take things over. A new wave arrives every so often. There's a few more people, or different people get interested and bring it forward. There were two other things that relate to this that appeared within the decade of these. Really, the original case problem book anywhere was Tom Sherwood's book, *A Course in Process Design*, on which I had done that chapter on multi-effective operation. Then, interestingly, another book of case problems appeared from MIT, maybe in 1967. That was by a fellow named Sam Bodman, who was an assistant professor of chemical engineering at the time. He went on to become many things. The president of Cabot Company, the president of Fidelity Investments, and Secretary of Energy under [George W.] Bush Two. It proves that people who work with case problems can get somewhere.

12-00:43:58

Redman: Was AIChE looking for a new approach or simply more examples of case problems?

12-00:44:12

King: I think the AIChE effort was to spread a way of teaching. To bring more familiarity with that way of teaching, with the hopes that case problems would be integrated into the curriculum more, which they have been. But there are two ways of bringing them in. One is a case problems course that is nothing but case problems. Even though we had them at Berkeley, in my time of teaching it, and Scott Lynn's time, that's a rarity around the country to find case problem courses. But what you do find is people drawing from an array of case problems to get something that fits as a part of their thermodynamics course, their fluid dynamics course, their separations course, whatever.

12-00:45:02

Redman: Do you have a sense of what the NSF's interest was? Actually, do you recall from what division of NSF this—

12-00:45:11

King:

There is, within the engineering directorate of NSF, an engineering education division, which has had various names over the years. There is also a separate education directorate, but this engineering education sub-directorate, I believe, is where I was for support of these. So it was for the teaching purpose rather than any research aspect.

12-00:45:49

Redman:

I guess at this time, the NSF was not in the business of publishing, so that was never a question. Is that correct?

12-00:45:54

King:

Right. Had to have a separate publisher.

12-00:46:02

Redman:

What do you think that you particularly brought to the table for this committee in terms of both your education and then your expertise?

12-00:46:17

King:

I can answer what I may have brought to the table, and I can also answer what attracted me to get involved with it. What attracted me to get involved with it was that it was a very natural place. I have forgotten how the original contact had been made, but somehow, somebody that I ran into and knew at one of the annual AIChE meetings would have viewed me as a possibility for this committee. Again, I said yes, because it was interesting and looked like something good to do. What I think I brought to it was an interest in that form of teaching, honed by the fact that I was teaching case problem courses, and therefore came to know what ways of doing it worked well and what ways of doing it didn't work so well. And how far you take the class struggling with finding a solution to whatever the issue is before you sort of bring them in on the secret. What is the combination of how much you lead them and let them invent it? There have got to be elements of both.

12-00:47:32

Redman:

What is the alternate or alternates in terms of pedagogy in chemical engineering? You have this case study method. What else would be used in terms of how to teach students?

12-00:47:53

King:

There are basically three approaches. One is the traditional lecture. Another is the laboratory. There are laboratories in chemical engineering, much the same as in chemistry. A thing that has grown more, or at least has matured over the years, is the approach to the capstone senior design course. The idea is, of course, to put a capstone or last course on the things that uses all that they've learned in the previous courses, and uses it in a design sense. The trick here is that students usually work in teams in these courses. The reason is because

more heads are better than one, and because there is a lot of work to be done as you chase down leads or fill out designs of subcomponents of a process or so forth. I think the thing that has grown or matured over the years is the way in which students work together, and how the project is set and guided to build elements of teamwork, leadership, using everybody's individual talents to best advantage. That kind of thing. I think better and better ways have been found, generally, over the years on that. That's not unique to chemical engineering. That's true for all engineering. One of my reasons for concluding this is having recently been at a national engineering education conference that reviewed the way in which these team projects have been done and have changed over the years. It was quite interesting to see. I think that's something that's gotten much better as the years have gone on.

12-00:50:12

Redman:

Do you think that that's due to a growing community of engineering education experts?

12-00:50:19

King:

I think there is a place where the fact that there is an engineering education community has been a very helpful thing, yes. That is kind of an interesting phenomenon. Just as the NSF has an education directorate, and then engineering education within engineering, not within that other directorate [of education itself], so there are colleges of engineering around the country—there are two of them, at least—that have a separate department of engineering education with the graduate program, in engineering education. The two examples I'm thinking of are Purdue and Virginia Tech.

12-00:51:02

Redman:

Where do graduates finish with that? A doctorate?

12-00:51:08

King:

You can get a doctorate, and probably a master's also. I don't know the Purdue [University] or the Virginia Tech [Virginia Polytechnic Institute and State University] one that well. Although I have an undergraduate student from here who did a senior year project with me after I returned from the Office of the President. The senior year project was on engineering education. She is now a doctor's student in that Purdue department.

12-00:51:34

Redman:

Where do students with this degree—what do they do?

12-00:51:39

King:

What do they do? They work on teaching methodology. It's not so much curricular design, or the grand question that is the one that draws me, which is whether it should be a graduate program or an undergraduate program, and how broad engineering education should



be. These departments tend to work on finer-tuned things, such as how to teach design using a particular new teaching pedagogy. Things that have to do with the conduct of a course, for the most part.

12-00:52:21

Redman:

With the growth of the engineering education community throughout your career, what has the place of case studies been? I'm sure that it's changed through that time.

12-00:52:33

King:

They're there. If I were to list what I think are the seven or eight most prominent topics of research in engineering education departments, I don't think they'll be on it. The case study phenomenon has been one of appealing to individuals who then want to become ball carriers and promoters for it.

12-00:53:02

Rubens:

Just for my clarification, the case studies aren't about different aspects—these broad, different programs?

12-00:53:09

King:

I want to make a distinction now between case studies and case problems. A case study takes something that happened and dissects it. It's all over and done with. Maybe the company made this decision. Should they have made a different decision? That's what's very commonly used in places like the Harvard Business School. Case problems are open-ended. You pose the problem. Maybe there was once a solution to it, maybe there wasn't. It doesn't matter, because the students, guided by the instructor, are going to take it up as a brand-new need, a brand-new problem. A case problem has many more elements of synthesis and invention in it than a case study would. Case study dissects what did happen. A case problem says there's a need for finding a way to manufacture X; how shall we do it? By what reaction might it be made? Okay, if you're going to use that reaction, then here's this mixture that comes out of it. How are you going to take it apart or separate it? That kind of thing. Open-ended. New.

12-00:54:32

Rubens:

You were talking about that there are strengths and weaknesses in the case problem phenomenon. Does one of them have to do with the teacher's capacity, the professor's capacity, to really utilize that kind of method?

12-00:54:46

King:

You've identified there the chief reason people steer clear of it, is that it's scary. You have to be willing to take whatever comes back from the students as an invented way of doing it. You either have to be adventurous or you have to have a large world of background and

experience in the area. As an example, I would use coffee processing as a vehicle for many of these cases.

12-00:55:29

Redman:

Could you give us some examples of some of the case problems that were developed for the AIChE committee?

12-00:55:38

King:

I can give you examples of case problems I've been involved in the development of, but I can't be sure of what's in that book and what isn't. Alan Foss and I actually had some master's theses that were of this nature, designed to put together a case problem. That was in my early years here, when we had a part-timer evening master's program available in chemical engineering and some of those students liked to do this. One was on a hydrodealkylation plant and what might be the best way of carrying out that process and doing the separation. Another that I remember well, I think I've mentioned previously, is a holdover from my days directing the Practice School in New Jersey at the refinery. That was a big dryer. Beds of solid desiccant that air would blow into, and the desiccant would dry the air. Then you would blow hot air back into the bed to dry out the desiccant again and reuse it. This whole thing was on a cyclic operation, and it was malfunctioning. The question was, what was the cause of the malfunction? In that it's a cyclic process, there are many places you have to look and think about to see what might be the malfunction. What you see as a problem in this cycle might have actually developed four cycles before, or forty cycles before. That was another example.

There were other troubleshooting problems. Scott Lynn and I got very big on those, and so did Don Woods. Don Woods eventually, much more recently, now, published a book on troubleshooting problems. There, the idea would be to pass out to a class a sheet of paper that describes something that isn't working right and what the symptoms are. Then you play what amounts to twenty questions. The students would come up and say, "I need more information on blah, blah, blah. What would this gauge read?" Or, "Would this temperature be steady or cycling?" Questions like that. The instructors, knowing what was wrong with this thing, because you'd always picked in advance what was wrong with it, would then give an answer that corresponded to that being the thing that was wrong. We sort of had to think on the spot as to, if this flaw was here, what would it cause in this symptom? That we did quite a bit of, too. That was great fun. That was very good for the students.

## Audio File 13

13-00:00:04

Redman:

I had one last question about case problems. You've talked a lot about this being a sort of discussion-based activity, but it seems like, especially for trouble shooting, this could be a hands-on laboratory activity. Did that happen?

13-00:00:30

King:

Yes. The case problems were discussion as you tried to get the whole class to do the inventing of the solution to the case problem. That was carried out in a discussion or Socratic manner. The troubleshooting problems were individual exercises, and so everybody would come up with their question, wanting to know what a particular dial read, or whether the temperature cycle, or so forth. That was asked quietly at the front of the room, so that is individual instruction with the student coming forward with what it is they want to know, because that's a very important part of it, is to figure out what piece of information will be most helpful to you in solving this.

13-00:01:14

Redman:

It seems to me, though, that you would be able to, for some of these troubleshooting problems, set them up in a laboratory setting and let students actually read gauges and actually be able to work with equipment. Was that done?

13-00:01:29

King:

That's a good idea. There was, for many years, a chemical engineering unit operations laboratory, complete with entire afternoons of work on real equipment and reports and so forth. I never taught that course, so I did not have involvement with it. Yes, I suspect even that laboratory equipment did not work right at times, and so it became a walking troubleshooting problem. Yes.

13-00:02:08

Rubens:

We talked at the break about the separation division of the AIChE. You form it in 1990. We've been talking about the whole decade of the seventies. Why is there such a lag?

13-00:02:29

King:

Well, because there is inertia in systems. The AIChE had had a program committee with all of these divisions, and a huge division, section two, I think it was called, was the unit operations section of the program committee, and then it had divisions of filtration and heat transfer and distillation and whatever. Probably about fifteen different divisions. The separations division came about because, just before 1990, a person who had worked with me on a number of things came to me and said, "There should be a separations division of the AIChE." His name was Jimmy Humphrey. He is a Texan through and through.

Has his own consulting company in Texas. His proposition to me was, “Look, if you’ll take the lead on this, the titular lead, at least, I’ll do the work.” Oh, that sounded good. And yes, I agreed there needed to be a separations division. So we went to the program committee and asked to be chartered to put together a proposal. We got seven or eight other people involved in the proposal, and then wrote a proposal, which was reviewed by the council of the institute—first reviewed by the national program committee, then put to the council of the institute, reviewed by the council of the institute. Approved by the council of the Institute. The result was a reorganization of the program committee. Division two became the Separations Division. Other things that had been unit operations but weren’t separations were rearranged into other parts of the program committee. It was a rather radical overhaul.

13-00:04:35

Rubens:

So even though this was your bag, your thing, you weren’t pushing that earlier?

13-00:04:40

King:

I had not, no. That’s another thing that’s characteristic of me. Sometimes it takes somebody to push the obvious to me and convince me to do the obvious, because I haven’t seen the obvious.

13-00:05:20

Redman:

If we could talk about your sabbaticals, you took two?

13-00:05:24

King:

I took two sabbaticals ever.

13-00:05:26

Redman:

Okay. Let’s talk about the first one.

13-00:05:28

King:

The reason it was no more than two, of course, was that as I got into more and more administrative posts, the more and more impossible it became to do the sabbatical leave. So if you’ll count your intervals, sabbaticals come on the seventh year, and that’s exactly what happened here. My first sabbatical that I was eligible for was for the spring semester of 1971. As we looked at this—and I say “we” because Jeanne obviously had to be part of such a decision—what is it I could do with sabbatical that would make sense? I had written my book. The first edition was not yet ready for a second edition at all, so that wasn’t a thing to do. We should get away, but how far away can you get, given the fact that you do have graduate students and their schedules are not such that they’re all going to go away while you’re on sabbatical. They do have to be tended to. So that was a factor. Then, what is a nice place? The answer to what is a nice place, in our case, has always had to do with mountains and canyons and the

outdoors. You can see my two sabbatical leave locations satisfy that quite well, one being Boulder, Colorado, at the foot of the Flatirons on the east side of the Rocky Mountains. Absolutely gorgeous place. I picked it for the location, for the one-hour flight back to Berkeley, to be able to meet with some frequency with my graduate students by coming back. I never went overseas on a sabbatical because I did have these various national activities going on and I would need to continue them from wherever I was on sabbatical, which meant I needed to travel within the U.S.

Then in the case of the first one, I actually was at two locations. One was the University of Colorado Chemical Engineering Department. The other was the National Center for Atmospheric Research [NCAR], up on Table Mesa, truly at the foot of the Flatirons. I picked NCAR because of a recognition that chemical engineering tools of thermodynamics and transport and so forth were very relevant to meteorological and climatological issues. There were no chemical engineers working there, and I wanted to make the assessment, with about half the time available to me, as to whether that might be a place to try to take my research. It was also true that Berkeley didn't have much in meteorology then. It never has had much. The meteorology department in the UC system is at Los Angeles. There's another very strong program up at the University of Washington, but Berkeley has just not had much. What little it had was within geography, and back in those days was more descriptive rather than [being a] quantitative engineering type of thing. So I did that. Having put my time into that for half a semester, I came to the conclusion that probably wasn't the right answer for me to go there, that I was better off sticking with the drying and food-related research, and then the solvent extraction work that I started after that. But it was to explore a possible shift of research emphasis that I went to NCAR. NCAR was the first attraction. Once it was known that I was going there, I then got invited by the people at the university in Boulder to come have an office for another half of my time there, which I did, and got to know the people in that department. That was 1971. The 1978 sabbatical—

13-00:09:46

Rubens:

Did you take the children with you?

13-00:09:47

King:

Oh, yes. We had, at that time, three children, and they all went. Catherine was not yet school-age at all. Mary Liz and Cary went to Mapleton School. First of all, where did we live in Boulder? We lived on Pine Street. You will know exactly what Pine Street and that house looked like if you know "Mork and Mindy." Mork and Mindy lived in Boulder, on Pine Street. Yes, indeed. Old, old house. We had rented it from a professor from U of Colorado who had gone on sabbatical. The

school for that was Mapleton School, which must have been started back in the days of the original silver boom in Boulder. It had the distinction of being about as wide as this room, and yet four stories high. Quite an interesting structure. So yes, we had children with us. Of course, we did a fair amount of exploration of the Rockies and of the canyons and down into southern Utah while we were there, that being the secret reason, or not so secret reason, for being there.

13-00:11:24

Redman:

You had mentioned that you sort of wanted to explore different research opportunities at NCAR. You chose not to go that direction. Was that because of difficulties that you encountered in research, or was it just not a good fit for you intellectually?

13-00:11:46

King:

No. I believe the reasons for that conclusion—there were absolutely zero other chemical engineers in that at the time.

13-00:11:54

Redman:

Why was that?

13-00:11:57

King:

Because there is a field of meteorology, and the other thing I found relates to this. That is that that field knows its transport phenomena and its thermo very well indeed, and so you didn't have the un-traveled territory to work with that I did have in the food application. That's the principal reason.

13-00:12:24

Redman:

What kind of work were you doing at University of Colorado?

13-00:12:30

King:

My mail and writing papers. Just using that, a) to get to know the people in the department, which I did, and I had lots of friends there, and, b) just use it as a locale to do the other things that you can't turn loose of completely while on sabbatical.

13-00:12:54

Redman:

What were the production requirements, either from the department or the university, for sabbatical? What were you expected to come back with? With articles, with a book manuscript? Was there anything that you—

13-00:13:11

King:

I would say no expectations of any kind were conveyed to me. I should use it in the way that I would find intellectually most profitable and most valuable to my career. Incidentally, that sabbatical was a semester. The first one-third of that time, we did not go to Boulder. We only went to Boulder for the last two-thirds of the time. The first one-third of the time, I was invited by Art Morgan to spend it down at

the Western Regional Laboratory here in Albany, California. That was fine for getting a better view of all that they were working on related to foods down there, but it wasn't a sabbatical. I wasn't far enough away. I would spend my time driving back to my office and getting things and doing things. That wasn't enough of a break.

13-00:14:09

Rubens:

Because you were also vice chair of the department.

13-00:14:12

King:

Yes. I think that role got taken by someone else for the spring, and I've forgotten who it was. The vice chair function in question was making sure that there was financial support of all the students. That was the main, ongoing thing. All the graduate students.

13-00:14:41

Redman:

This was the first time, perhaps ever, except for the cross-country travel, that you were able to have this sort of family dynamic. You put aside your job. You had this break, to some extent. How did this change your family dynamic, if at all?

13-00:15:05

King:

Family dynamic? If that's the dynamic within the family, I don't think it particularly changed it, except it afforded us more opportunity to use the weekends for recreation and exploration, which we did. That was the chief change. Other than that, the family was the family.

13-00:15:40

Redman:

So if you could tell us about your second sabbatical, which you did in '78.

13-00:15:43

King:

Yeah. Now that's different, because at that point, I'm department chair. I did have a vice chair who I thought had it in him, and did have it in him, just simply to take the role of chair for all but the largest questions for that semester. That was Mitch Shen. Mitch unfortunately became very ill a few years after that and actually passed away from a cancer at a very young age. It was a terrible thing. He functioned as the chair while I was gone. I again used the logic that you go away enough to be away, but stay close at hand enough so as to be able to come back and talk with the graduate students on an easy, frequent flight type of trip. Then the second thing I clearly wanted to do on that sabbatical was the second edition of my book, Separation Processes. That set out what the sabbatical should be used for. I approached people, some of whom I knew, at the University of Utah to see if they would like to have me. Oh, yes, they would like to have me. So I went.

We lived there in a home that had been vacated by a faculty member also, who was on leave elsewhere. On the uphill end, or eastern end, of

Salt Lake City, right at the base of the mountains, magnificent view out over the city and the lake. This worked very, very well for the second edition of my book. That was what I did with my work time. All day, every day, other than the mail that absolutely had to be done. There was this beautiful Marriott Library at the University of Utah, which was not that heavily used and which had everything in it. All the references I wanted or needed were at hand, and it worked fine that way. Then, of course, the recreational opportunities are beyond comparison there in Utah. This also gave us the opportunity to live in the middle of a Mormon community. That had a number of interesting facets. I think where that was most difficult was for Cary, our son, who was in a late year of high school then. Here he was, ripped up from El Cerrito [CA], where he had been going to high school, and put in this place with these very different people around him, and figuring out how to interact with them. I think that was hard for him. For me, it was kind of an interesting sociological experiment. There was the feature that the whole chemical engineering department faculty, most of them, would eat lunch together in a room there. I would bring my bag and join them for lunch. We'd talk around. I would say about 60 percent, maybe 70 percent, were Mormon. The others were not. I was proselytized a few times, but resisted that. It was just an interesting experience to live with for a while and see what it was.

The other part of the social life activities there is that the Mormon Church does have activities just about every evening of the week. You didn't use activities for seeing people that much. On the other hand, when there were social gatherings, they were of a different nature. I remember going to a home for dinner. We all had dinner and then we were put in the living room. We sat around in a circle and each was going to tell about ourselves. That's what the rest of the evening was, was each of us telling about ourselves.

13-00:20:02

Rubens:

Your wife as well?

13-00:20:03

King:

Oh yes.

13-00:20:05

Rubens:

There's no alcohol at parties?

13-00:20:06

King:

No alcohol. You had to play the game before hand, that I guess is characteristic also. I remember it very well because we actually did reasonably well in it. You were to go around the house looking for rhyming things. For example, here's a bed with a red jacket thrown on it. Well, that's red on bed. And so forth. There were forty-five or seventy or some number of these things that you had to try to pick out.



13-00:20:45

Rubens: That they put together?

13-00:20:46

King: Yes, they had been put together particularly for the event. Kind of interesting. That may seem like an odd choice for us to have done that. A lot of my career has been working with very different people all together. That gave a way of understanding yet another portion of the culture of the U.S.

13-00:21:16

Redman: Was there someone's work at Utah that you were attracted to?

13-00:21:21

King: Bob Seader, who was the department chair, was a separations person. That was a little interesting, because only after I got there did I discover that he was writing his separations book, jointly with a professor Ernie Henley from the University of Houston, which was going to become a book that competed with mine. So whereas I had gone there thinking I could bounce separations issues and ideas off of Bob, this changed once I found out this other book was being written. Nonetheless, it was a very good place. Definitely that's the way to write a book, is as a start-to-finish, straight-through job, spending nearly all of your time on it.

13-00:22:10

Rubens: A sabbatical is only six months?

13-00:22:12

King: Yes, one semester. You're going to have to remind me of the quarter system years. I think they were before these sabbaticals, because these were both semester sabbaticals.

13-00:22:27

Rubens: '67, I think.

13-00:22:29

King: Yes. [Then] It must have been over before '71.

13-00:22:34

Redman: You had mentioned the difficulty that your son in particular had with changing schools. Do you get the impression that your children enjoyed these opportunities at the time, and then maybe in retrospect?

13-00:22:50

King: I think it differs between them. Mary Liz, our oldest daughter, I think enjoyed these. You must realize that for the Salt Lake City one, she was in college. She was at Yale, so she just came back for vacations. Cary, I think the difficulty was being taken away from friends and a

social setting he was accustomed to. That's probably a pretty bad time to do it, late in high school.

13-00:23:27

Redman:

And I assume that Jeanne thought this was a great adventure?

13-00:23:32

King:

She loved it.

13-00:23:34

Redman:

That's what I thought. I'm interested in talking about some of your awards and honors. The AIChE honored you with three different awards: the Food, Pharmaceutical, and Bioengineering Award, and you talked a bit about that section, and the William H. Walker Award, and the Warren K. Lewis Award. Could you just tell us a little bit about what these awards are?

13-00:24:06

King:

Yeah. There's one before that, which doesn't look like an award, but was, which was to be the Institute Lecturer. The Institute lecturer, there's one of these at each AIChE annual meeting, on some subject. The subject is typically picked first by the program committee, with regard to timeliness and other factors, and then they go to find who to give the lecture on the subject. In the case of that lecture, the subject was process design that they wanted, and they came to me because of the case problem work. It's interesting to compose a lecture to a thousand people, or however many it is, on the subject of case problems. How do you do it? In hindsight, I think I could have done it better than I did. I put together the various thoughts and ideas. I'd been having some research relating to process synthesis, as I mentioned earlier. Put all of this into the lecture. That was being recognized to speak on a subject.

13-00:25:23

Rubens:

Where was that?

13-00:25:28

King:

I don't know.

13-00:25:31

Redman:

1973.

13-00:25:33

King:

It's wherever the 1973 AIChE annual meeting was. You go to an annual meeting, and you get to see the city on your way from the airport to the hotel on your way back from the hotel, but you stay in the hotel for the meeting. They all look alike. It's like Ronald Reagan's redwood trees. Once you've seen one hotel, you've seen them all. Anyhow. The food, pharmaceutical, and bioengineering division—I mentioned this was one that grew up as the institute went

to divisions, which was one of the manifestations of what had been started with this expanding domain report, but the divisions were done for many other reasons, too. People working on bioengineering—there wasn't much of that at that time. Food-related issues and pharmaceutical-related issues—a small group within the institute. What you do for these awards is that, typically, a colleague in your department will nominate you. Maybe a colleague who is in the same field but from another university will nominate you. You get seconding letters, and all of these go into a judging committee that selects the recipient of the award. Some departments make quite a business out of this. The chemistry department at Berkeley for years has had an internal committee, the sole function of which is to make sure that deserving people get nominated for appropriate awards. Chemical engineering was more informal than that. That award, I think, recognized the freeze drying work and the beginning of the spray drying work. It was very nice to have.

The Walker and Lewis Awards, they are both named after pioneers of chemical engineering from MIT, William H. Walker and Warren K. Lewis. The Walker Award is for a book. It was recognition of the "Separation Processes" book. The Lewis Award is for a distinguished career in education. It was that, and very nice. I am grateful to the people who nominated me. The way things would work in the department, you usually didn't know that you were being nominated for one of these things, unless whoever was doing it came to you to ask for some information on some part of your career that was not evident from your resume. But since, at Berkeley, we're all preparing advancement cases for ourselves every two or three years, you can go to the department chair and get the publication list for a colleague. They'll of course be glad to do [i. e., provide] it. Often, these nominations were done without the person knowing it.

13-00:28:56  
Redman:

You received another award for your work in education in 1978 from the American Society for Engineering Education, a George Westinghouse Award. Can you tell us a little bit about that?

13-00:29:07  
King:

Yes. That's for work in engineering education, and it probably recognizes the case problem work. I know how that nomination was made, and it's very unusual. We had a visitor to the department who was from one of the CSU [California State University] campuses that taught chemical engineering, Henry Sheng. Henry decided that while he was with the department, with no reward or recompense expected of any kind, nor any being possible, decided he would nominate about four of us for awards, and he did while he was with the department. This was the one he did for me. I remember it quite well because I had

to go to that at the end of the Salt Lake City sabbatical. We were out of the house at that point, so the family stayed in the Hotel Utah downtown while I went off to Vancouver, which is where this award was given. I remember it for another unpleasant reason, too, which was that I went up on a particular local airline, which we shall not mention, and got a severe case of food poisoning as the result. So here I was with food poisoning at 3:00 a.m. on the morning of the day I was to receive my award at a banquet that evening. Vancouver is part of Canada, and so this banquet was in the British tradition. There was dinner, which I didn't eat much of, and we were all aligned at the head table, the seven or eight of us who were getting awards. I had to sit there during the entertainment, and the entertainment went on for about an hour and a half. Bagpipes and such things came back and forth. Here I am in the misery, recovering from food poisoning. It was quite an event. But that was a very nice award, and, looked at without memory of the food poisoning, a very pleasant event.

13-00:31:33

Redman:

More recently, the Council for Chemical Research [CCR] gave you the Pruitt Award, and the American Chemical Society gave you the award in Separation Science and Technology, so if you could tell us a little bit about those.

13-00:31:45

King:

We haven't talked about the Council for Chemical Research yet, and we probably should make it a separate subject later on. The Mac Pruitt Award recognizes accomplishments in fostering university-industry relations within the chemical field. I had done that in various ways, but prime among them was the work in the founding of CCR. Maybe let's hold that one until then. The other one was the American Chemical Society—has a division of industrial engineering chemistry, and within that, a separation science and technology subdivision. That award is given by the subdivision for work in separations that is pertinent to that division. Loosely translated, that means there should be an actual science of chemistry aspect to the research, even though the research itself may be engineering. That one, I'm sure, relates to the solvent extraction and absorption work, where I was using reversible chemical complexation to get selectivity and regenerability in the separation. That was taking the organics out of water, which we discussed before.

13-00:33:11

Redman:

Am I missing any major awards, honors, knighthoods?

13-00:33:19

King:

Only one heartwarming award, which came some years after that, but was from the Yale Engineering Association, where they pick an outstanding practitioner. They have an annual banquet for the

association, which is an engineering alumni association. This is in Woolsey Hall in New Haven, on the campus. The heartwarming part of that is that all Yale engineers are bonded by the fact that Yale engineering has been through all these traumas over the years and has been hanging by its fingernails to survive, although it's doing quite well at Yale right now, but that wasn't true in the past. One is among, if not friends, those who share the same experience with you of having been part of Yale engineering. That award is not just from a field of academics or for research. It's for what one has done in engineering, competing with everyone. To be thought of that way by that society was very nice indeed.

13-00:34:29  
Redman:

Did you bring Jeanne to—

13-00:34:32  
King:

Jeanne did not go to that one. I did. Why not? It has to have been scheduling things, because she would have otherwise. She did come to several of the others, like the Lewis and Walker Awards.

13-00:34:48  
Redman:

Did you and Jeanne go back to—well, her family was still there.

13-00:34:52  
King:

Her family is there. Her mother is still there, at age 102 this June. [Editor's note: Her mother passed on in late January, 2012.] We've gone back for family visits with some frequency. Jeanne goes a lot just to keep up with her mother, who is now in a home there. We did own the house there in Madison, Connecticut for twenty-five years. Our big accomplishment last year was finally selling the house, just the day before the Obama—there was a federal mortgage program to encourage home purchasers. The day before that expired, it closed.

13-00:35:54  
Redman:

I'm interested in also talking about what your students have done.

13-00:36:51  
King:

This is [a list of] doctoral students. It doesn't include the master's students, and there have been some distinctive ones there, too. I think I have mentioned previously Paco Barnés, who worked with me, graduating with a doctorate in '73, who became both a minister in Mexico and the rector of the UNAM, National Autonomous University of Mexico. Keith Alexander deserves some comment. Keith worked with me on the single droplet dryer problem. Graduated in 1983. He's an African American. He grew up in Richmond and had not been out of Richmond—California—much. He started off with Chevron, I think probably as a good job, close to home, and then switched before too long to CH2M HILL, which is a big, diverse company that does processing and design-type efforts. Big environmental control waste

treatment efforts. He rose up to become a senior vice president of CH2M HILL. Then in 2005, was looking for something different. I guess he'd done well. He decided to leave CH2M HILL. Was a portable chief executive for six months or so, which means when a company needs a CEO on a temporary basis, he would do that. Then he came back here to Berkeley, and he is here as an adjunct professor, having developed a program in product development for the chemical engineering department, which is a new and different program that they have to try to recognize the fact that, as the uses of chemical engineers have evolved over the years, products rather than processes have tended to become more important. When you're going to work on a new product, there are many things that come into that consideration that were not part of classical chemical engineering. Keith has organized a very nice program on that.

13-00:39:24

Redman:

If I could break in, is that a program that's fairly unique to Berkeley?

13-00:39:29

King:

Yes, it is unique to Berkeley. There are books on the subject that have been written by faculty from other universities, but having an actual master's degree program in this is unique to Berkeley. I should mention Kumar Chandrasekaran, who did a doctor's with me on diffusion and freeze drying, ending in 1971. He was from India. His father was a very well-known, internationally known, demographer. He stayed in California after graduation. Worked first for Alza, and then moved to some other corporations. Then for about ten or twelve years, was the president of InSite Vision in Alameda, which is a medical optical engineering type corporation. He not only has distinguished himself, but has a couple of very distinguished sons, one of whom is now a high executive of the Washington Post, and who wrote the book *The Green Zone*, which was a bestseller about four years ago and then became a Matt Damon movie. It's interesting. Now, who else to single out here?

13-00:41:05

Rubens:

We'll include that list in the—

13-00:41:07

King:

Yes, please do, because it's very hard to decide which of these to talk about and which not. Yet, I simply can't take the time to talk about all of them. There are, interestingly, relatively few professors among my doctor's graduates. One is Gary Rochelle, who's had an entire career at the University of Texas. I think the reason is that, because of the rather applied nature of my research and the fact that you would always have the industrial application in mind and driving what you did, there was a tendency among my people to go to work in industry. So Gary Rochelle is a professor, Doug Frey is a professor, and Tony

Garcia is a professor. Then Larry Ricker was, for his career—he's just retiring—at the University of Washington. Scott Moor, who is at the university with the unpronounceable acronym—Indiana University-Purdue University Fort Wayne [IUPUI]. But others, no. Some are with Proctor & Gamble, which has been a rather natural flow. One of my very last doctor's students, Jack Starr, is doing quite well with Cargill right now. Mike Clark grew to be an executive of Dow Chemical Company. Is now retired and living in Nevada. Peter Clark, who started out with me working on processing aspects of freeze drying, went with the Department of Agriculture Lab for a while, and then ended up as the president of something called Epstein Food Process Engineering in Chicago, and has been quite a successful consultant for about a decade or a decade and a half now. Maybe let's just leave that as sort of an overview of what the students have done. There are plenty of wonderful comments to be made on many others.

Let me mention one other, though, who is Gail Greenwald. She was an MIT graduate. She came with me. She did the first project on the single drop dryer—Keith Alexander was the second one—and did very well. She went to work for Arthur D. Little in Cambridge, Massachusetts, which is a huge engineering consulting company. One of their distinguishing features is that they literally did figure out how to make a silk purse from a sow's ear. Well, come now, they couldn't, because silk comes—well, anyhow. They claim to have. She rose to become a vice president of Arthur D. Little. She left that and is an entrepreneur in the biotechnology industry, with something called Caveo Corporation right now. She has gone on to become sort of a startup person for new companies. I have some others who have been involved in that kind of thing. Janet Tamada was a very good student and has been involved with several companies that are companies being built up in the pharmaceutical industry. She was involved in the development of the non-penetrating blood sugar device. The sort you just wear on your wrist and it tells you your blood sugar, for diabetics. Let's stop there.

13-00:45:08

Rubens:

You mentioned one student who brought you in as a consultant. To round out the conversation today—

13-00:45:17

King:

That was Tom Mix. He directed the Practice School when I was a student at Oak Ridge.

13-00:45:22

Rubens:

Did any of your students have you come to lecture? The ones who became professors or—

13-00:45:30

King:

I've given guest lectures at numerous universities over the years, and I'm sure that ex-students who were at those universities may have had something to do with that. In terms of anyone bringing me in as a consultant, I don't remember any, although I can think of somebody who was a Berkeley student and who took many courses from me, who got his Ph.D. with Charlie Wilke, who brought me in as a consultant. That's Gautam Mitra, who was with Cutter Laboratories in Lower Berkeley before it became part of Bayer. I think we discussed Cutter a little last time. They were doing blood processing, and freeze drying was prominent among the things they did to blood. He invited me for that. As I say, I could go into many others, but.

13-00:46:43

Redman:

How involved were you in initial job placement of your Ph.D. students?

13-00:46:52

King:

That's an interesting question. Usually the way it worked is that the career placement center here at Berkeley would bring in recruiters from here and there. They would interview students at the bachelor's, master's, and doctor's level. Then over the years, there developed a protocol whereby larger companies wanting to recruit Ph.D. students would come to the College of Chemistry and be given a room in the college to interview Ph.D. students. By and large, if the person was interested in industry, the first job of my Ph.D. students would come about in that very standard way, through the company interviewer having come here and having interviewed a bunch of people and having picked them. That would also be true for my master's students. There are some cases that probably have some difference here. Peter Clark going to the Department of Agriculture as his first job, I certainly had something to do with. The ones who went into teaching positions, the way that one works, is they may apply directly to a department, or they may be nominated. I did nominating of some of my students who ended up in the academy. I don't see any other cases where, for a doctor's student, I had that much to do with their actually getting the first job.

13-00:48:44

Redman:

Directly.

13-00:48:45

King:

Directly. Invariably, after the corporate recruiter interviews them and then they make the cut to be one of the people who are being seriously considered, then, of course, somebody from the corporation calls the professor. Has a big, long conversation with them about all the attributes of the student. I would do that every time.



13-00:49:06

Redman:

Your personal relationships with people in the field of chemical engineering didn't play nearly as much of a role as perhaps your—

13-00:49:14

King:

I can give you one. Over my twenty years of consulting with Proctor & Gamble on the food and beverage products, I had two principal contact persons. First it was a man named Tom Rich, and then in the later years, it was Larry Genskow, who was the drying expert for the company. Indeed, John Hecht, one of my last Ph.D. students, has worked for years right under Larry Genskow, and in fact has taken his role now. That was a matter of me recommending him to Genskow and him picking him.

13-00:51:00

Rubens:

This is very small, but you said you spent part of your sabbatical, the first sabbatical, at—

13-00:51:09

King:

Western Regional Research [Laboratory, USDA].

13-00:51:11

Rubens:

What were you doing there?

13-00:51:14

King:

Oh. Well, I was sitting in a lunch—pardon me. Lunch, I will get to. Sitting in an office in the engineering division there, and Art Morgan was the head of the division. What I was doing was my own research, but using all the people-to-people things. Running into people in the hall or going to see other operations within the lab. Using all of those personal contact things to get to know what they were doing better, get a better feel for chemical engineering applications and opportunities in that laboratory and the work they were doing. Now, the reason I blurted out “lunch” rather than “room” was that one of the things I did a lot was join the lunch group with Art Morgan, which would come up to Giovanni's here on Shattuck Avenue—that's getting really close to the campus—and have conversations on whatever. It was a good opportunity to get a feel for how that whole operation worked. That was important, because in the food and agricultural areas, the research of the U.S. is done very largely in the government USDA labs and in the universities. By getting a good feel for the USDA labs, you pretty much know, as a result of that, the research picture for the whole U.S. General Foods wouldn't like me saying that, because they do have their own research department, and Proctor & Gamble, of course, wouldn't like me saying that, because their whole business approach in the foods industry was based on having their own research. But by and large, that's true.

13-00:53:08

Rubens:

Were you through with the turkeys by then?

13-00:53:11

King:

Yes, the turkeys ended at the end of the first USDA grant, because I moved onto another commodity, which was fruit juices.

Interview 7: June 8, 2011

Audio File 14

14-00:00:03

Redman: I'd like to switch gears this week and take some time to talk about your family and community life. You've already talked about how you met Jeanne, as well as sort of the early years of your marriage, but we haven't talked much about your family here in Berkeley. Just to put this on the record, can you give us the dates of your marriage and the births of your children?

14-00:00:37

King: I'd better remember that, hadn't I? The date [we were married] was June 22, 1957. I didn't catch the second part of the question.

14-00:00:48

Redman: Then also the dates of your children's births.

14-00:00:51

King: Oh, okay. We have three children. We also had a fourth, who didn't survive the first year. The three living children: the first was Mary Elizabeth, and she was born March 16, 1959. Then there's Cary, to whom we just simply changed my name from the third to the fourth. So he's Cary Judson King the Fourth. He was born April 2, 1961.

14-00:01:35

Rubens: We did talk in a previous interview about you traveling out to Berkeley with two children in the car.

14-00:01:43

King: Yes, and the cat, who escaped in the western part of Virginia.

14-00:01:48

Rubens: So we didn't talk about your third child.

14-00:01:55

King: Yes, okay. Our third child, the one who didn't live, was born in 1965 and had a congenital heart defect. That, at one point, made him extremely susceptible to pneumonia, which he contracted in August of the year he had been born. He didn't survive the pneumonia. That was a traumatic, difficult experience for both of us, losing a child. There were several people in the chemical engineering department that were quite helpful then. I remember the Gorens and the Petersens coming over and spending a very welcome and helpful evening with us, just giving us some social contact again after this.

Our fourth child is Catherine, who was born in 1967, September 25. Catherine is very special because Catherine also had a congenital heart defect. It turned out, two or three years later, that she had both mental

and neurological development disability problems. Catherine is still alive, doing well, but has had special schooling all the way through her school years, and then has been resident at something called Concord House—out in Concord, California, about forty-five minutes away from us—and has been there now for quite a while, ever since she graduated from high school. I could figure out when that is, but it's been over twenty years. For the past seven years she has been learning independent-living skills in a satellite house near Concord House and run by it. She functions at a level of being able to read some simple things. She scans the newspaper and can see what the words and headlines are. She cannot do any adding or subtracting, and therefore there is no handling of money, which is one difficulty with regard to her ability to live independently. She is with something called Futures Explored in Lafayette, which is a day program that provides social and work activities in the community and is also a placer of such people in jobs in the community, when such jobs become available. These jobs are at places like pizza outlets, Roundtable, that sort of thing, or other simple minimum-wage type jobs. That has been her life. She comes home about one weekend a month. It has also been a very large part of Jeanne's life, because she has been in organizations that deal with such people all the way since then.

14-00:05:04

Redman:

I'm sorry to have to ask this, but having children themselves can be so much stress on a marriage. You speak so lovingly of Jeanne. You clearly have gotten through all of these hard times. But how much of a difficulty did that place on your marriage?

14-00:05:23

King:

I knew that it was supposed to be something that would be a difficulty in marriage, but I never saw the difficulty. The simple answer is, there's been no effect. We've been fine all the way through. I think we both knew that there would be things to do associated with children. Yes, there are some changes associated with the fact that they don't sleep through the night and get up early and all that sort of thing. I think that has not been a difficult thing or a stressful thing for us in any way. We're from two very different types of families. Jeanne is from a large family with many, many relatives. You're caring for children all the time. You know how to care for children. You know what babies are about and so forth. Now, I wasn't, as we have established before, having no siblings. With an air of both competence of confidence, Jeanne knew exactly what to do, and I was glad to help in whatever needed to be done. It was not a difficult circumstance.

14-00:06:45

Redman:

Could you describe your children? Describe their personalities a bit?

14-00:06:51

King:

Oh my. Okay. I have to say a little about what they've done in life, too, to give some background for this. I'll start with Mary Liz, as we called her. She was born in 1959 and is now Liz McCarty. Both of our children who went through normal schooling did it all in California and all in the Richmond school district. It was very different from my growing up, where I'd been to all these different schools. They went to one set of schools that were a natural sequence. They both went through the public schools of Kensington and then El Cerrito. Then when college time came, Mary Liz was choosing between Pomona and Yale and Berkeley. You had the situation of all her friends would be going to Berkeley. This was 1977.

14-00:07:57

Redman:

So she's quite intelligent.

14-00:07:58

King:

Yes, she is. Berkeley was not the same thing for admissions in 1977 as it is now. Pomona would be different, smaller, Southern California, and Yale was where I had gone, and for that matter, my father had gone to for master's work, and it was in the East, and I think was a somewhat traumatic thing to contemplate. She nonetheless did it. She went to Yale. This was not all that long after Yale had gone coed. It was not the year it happened, or two or three years after, but it also, I don't think, had been a decade since it happened. So it was still new. She did well at Yale. She, I think, participated in all the social life. She did connect a lot with Jeanne's side of the family. Her family's in Connecticut there. I think she got family support there and built bonds. Made being on the other side of the country and away from everything she knew less difficult.

She majored in—I think it was called geology, but it really had large elements of meteorology. Earth sciences, called at Yale. She stayed on for Masters at Yale in the same area. Probably, having grown up in this academic family, she thought the natural thing was to continue on to the PhD after that, and selected the University of Washington and was admitted there. University of Washington is very strong in atmospheric science and meteorology. It's a well-known program. They matched incoming students with research directors very soon after entry. They did what we do, which is mix and match. You don't come in knowing you're going to work with someone. She got assigned to a very well-known professor of British extraction who was spending a year on sabbatical in Britain, so she had, to my mind, the unfortunate experience of having no resident advisor during this first year. Probably because her interests were really elsewhere anyhow, she made the decision at the end of that year not to continue. I think that was probably a good decision. It was really the only thing that was

a logical outcome of not having the research director there for the whole year.

She's an intense, very dedicated person who really throws herself into whatever she does. Jeanne and I both discovered that when I was chair of an American Society for Engineering Education summer school for chemical engineering faculty in 1977 that, adventurously, I had scheduled to be in Snowmass, Colorado, so as to have all the fun of a ski resort in the summer. This was not the ordinary place these summer schools had been held in the past. They'd been held at universities. There we all were, in Snowmass, and Liz went along with us, and so did Cary, and so did Catherine, for that matter. Here we were, doing all the onsite organization. Nobody had scheduled any assistant to come, and so here's my daughter, just simply throws herself into the office of this whole big conference of several hundred people and is manning the desks, doing everything, sorting everything out, sending them here, sending them there. This has been her talent, this sort of thing. That was a very vivid first example of it back there.

Anyhow, after deciding that a Ph.D. in meteorology was not the thing for her, she then went to work with a very intricate knitting shop in Washington. Jeanne loves to knit. She [Liz] had learned to knit. She still does a lot of very quite high-powered knitting. And again, threw herself into that shop for a while. She became married to a fellow who had been in Seattle also. He was in the graphic design business. They moved from Seattle to the Los Angeles area because he thought his business was going to do better there. His was a sole proprietor type of business, doing graphic design for companies like Airborne Express, for their advertisements. She got herself a job at Caltech, in the biosciences division, and became a principal administrative person to one of the professors there, Henry Lester, and then also moved to a broader role within the department while she was still there.

Mary Liz continued at Caltech, and then moved to Atlanta, where one of the post-docs that she had known at Caltech was on the faculty at Emory. She then married him. That marriage has lasted well. She started off at the Georgia State University office, which is the Georgia equivalent of the CSU office in California, and then moved to Georgia Tech as a departmental administrator for biosciences again. Then, as Nael, her husband, moved back to Emory—he had been Emory, Georgia Tech, Emory—she moved to Emory. He presently heads a big research program having to do with cystic fibrosis. It's located within the pediatrics part of the Emory School of Medicine. Liz had for years been principal administrator within pediatrics and now is into broader and broader research administration positions at Emory. The distinctive factor all the way has been throwing herself into a job and

doing it thoroughly and magnificently. The people she works with and for really value her for that.

Cary was born two years later, 1961. He was born while we were in New Jersey at the Practice School. Liz, having been born at Mount Auburn Hospital in Cambridge, back when we were at MIT before New Jersey, and Mount Auburn Hospital being where all the Cabots and Lodges and Longfellows and Lowells and so forth had been born. So Cary was born in Plainfield while we were in New Jersey. He was part of coming West with us. He also went through the El Cerrito school system all the way, and also faced the question of where to go to college. There was no question in his case, he wanted to stay close to home. He would do sort of the automatic thing for a student from El Cerrito High, and so he went to Berkeley. This was still before there was intense competition for admissions in Berkeley. If you wanted to go to Berkeley, you went to Berkeley. He did so, and majored in sociology. Graduated in 1984, I believe. Liz is an '81 graduate of Yale. He then faced a question of what he wanted to do in life. What has appealed to him has been A, being outdoors, and B, working with his hands, and so that's what he has done. He lives in San Pablo, north of here, and at present, has his own boat repair business. He started off, got employment with the Richmond Boat Works, while that existed—that's in the area of Richmond near the Ford plant that used to belong to UC—and worked there for many years, in boat repair. Richmond Boat Works got sold. He took that opportunity just simply to go into business for himself, and that's what he does. Sole proprietor.

Catherine was born in '67. Went through special education in the Richmond district all the way, which meant she went to school in various communities, because for grade school, special education would be in one place, for junior high, another place, and so forth. She was actually in El Sobrante for schooling for a number of years. The state takes such people through high school. Upon leaving high school, rather soon thereafter, we got her hooked up with Concord House, and she's been doing what I described for her since then. So there's the three children.

14-00:18:48

Redman:

Could you characterize both your relationship and Jeanne's relationship with each of your children?

14-00:19:04

King:

I don't quite know what you're after here. It's a strong, positive relationship with all of them. Jeanne has by far the closer relationship with Catherine, because she's been the caretaker all the way and given her involvement in all of the developmental disability and special education things that she's done over the years. She's also in

Catherine's world all the time. But my own relationship with Catherine is fine. I just happen to see her only one weekend a month. I would describe for both Liz and Cary that they are independent, do-it-themselves types. She'll come with family for Christmas, more often than not, to California, and we get to Georgia not as often as we should, but sometimes, and telephone calls in between. I would say there's nothing that I would think of as unusual one way or another about the relationship.

14-00:20:51

Redman:

Do you have any grandchildren?

14-00:20:52

King:

Yes. We have two, both by Liz. Cary never has married. They are both Hickeys, because Pat Hickey was the first husband. So there's Christopher, who was born in 1986, and there's Erin, who was born in 1988. At this point [i.e., now], Christopher has been to college, which was UC Santa Barbara. He's had an interesting career so far. He was always interested in film, movie sorts of things. His idea of interesting reading as a child was a big book that indexed all the movies. So he majored in film and theater at UC Santa Barbara and became interested in modern media industries. The other thing that happened to him during those years is that he started writing. He joined the staff of the Daily Nexus, which is the student newspaper at UCSB, and I think, late his sophomore year, became a columnist for them. These columns were on the subject of going places in California that were different, and what was his impression of them. Not the sort of thing you would think would be a big hit in the student newspaper, but the writing was magnificent and very distinctive and well done. He's the sort of person who could do a New Yorker piece with no difficulty. He also was on the editorial board of the Nexus his senior year.

Then there was the question of what to do after graduating from Santa Barbara. To me, it was natural: he should go to journalism school. We suggested that a few times, but then you have the fact that when parents, or even grandparents, suggest something to children, it very likely doesn't take. This didn't take either. His interest upon graduation was the video game industry, so he held internships and entry-level jobs with Disney, originally—the internship was Disney—and then with a company in Irvine, and then came to the conclusion that that wasn't fitting his life very well either, so he should decide what to do. He realized he could write well, and that should be the basis of it, but he was interested in political action and being part of that, so maybe he should get into the political world. He did ask me at one point, about two years ago now, was there somebody he could talk to about these things? I finally had a good idea. The good idea was to say yes, there is somebody. I've got a good friend who was dean of the



journalism school at Berkeley here, and who also, in an earlier part of his life, was press secretary to Mayor Ed Koch, a New York politician, and a very interesting politician. Of course, that's Tom Goldstein. Tom had been one of my deans when I was Professional Schools and Colleges provost. In fact, I hired Tom. We've always had a very close relationship.

So I contacted Tom. "Tom, would you be willing to talk with Christopher?" "Sure." Then I go back to Christopher. "Well, here's Tom Goldstein, and he says he'd be glad to talk with you. Christopher, this is Tom. Tom, this is Christopher." Christopher went to see him for a couple of hours one Saturday, and apparently really valued the interaction. Neither of them has ever told me what went on in these interactions. Neither of them. Of course, that's as it should be. Then it turned out Christopher was seeing Tom many Saturdays, or talking with him by telephone, and this went on for over half a year, all these weekend conversations. At the end of which, Christopher had decided that he thought the best thing for him would be to become a graduate student in the school of journalism at Berkeley. So Tom accomplished what my early danglelings had not accomplished. He [Christopher] brought himself up here as of a year ago. Got himself a job with Salon.com. Then also was working with El Cerrito Patch. Patch is a local online newspaper, and Charles Burrell, who used to be with the San Francisco Chronicle, edits the El Cerrito one, and so Christopher was doing stories for Charles Burrell for a long time. All of this while living with us, which he still is. Then he wanted a real job that would be a sustained salary and help him some with the costs of graduate school, and he went to work for Zynga. That's video games again, and is over in the city, in San Francisco. He is doing that and will be entering the journalism school this fall, and living on his own elsewhere in Berkeley as he goes into journalism school. That's a lot about him.

His younger sister is Erin. She lives now out towards Thousand Oaks, in southern California. Through several years there, she has completed two associate degrees and is very interested in dance. I think that has given her something she does well, she can latch onto, that she likes. She's also interested in the idea of social work as a career, and has just gone from community college to deciding where to finish off the last two years of baccalaureate-level college. We think she has picked California Lutheran—it's also in the Thousand Oaks area—with other possibilities being UCLA, which she did gain admission to, and that's quite a credit to her, and what was the other possibility? Oh, Mount St. Mary's. Brentwood, [Southern] California. But I think California Lutheran has either been picked or will very soon be picked. That's grandchildren.

14-00:30:03

Redman:

I'm interested in knowing how well your own children know their extended family.

14-00:30:16

King:

They don't have one on my side. They truly don't have one on my side, because if you look at my side of the family, I had two first cousins, both of whom I lost contact with long ago and do not know how to find. My closest King family contact is a second cousin, Spencer B. King, who lives in Atlanta and is a very prominent cardiac surgeon with Emory, who was in on the development of angioplasty when it originally happened. He's just about exactly my age. We've seen them a few times over the years. He has a delightful wife and family, very similar to ours. They live in a very nice part of Atlanta. That's the closest I can get with regard to my own family at this point. Now, Jeanne, of course, has lots of other family. Mary Liz ties greatly with all of them, so she wants to know how Diane is doing, how Marie is doing, et cetera, and probably maintains her own contact with them. Cary, no. He's not had an interest in that, and so he has very little contact with them. Jeanne's mother is still living, at age 102, in a home in Old Saybrook, Connecticut. They had lived in Madison and Guilford before that. Catherine is very, very interested in Jeanne's mother and keeps inquiring about her. It probably relates to fear of death and that sort of thing. Catherine has not had somebody really close pass away yet. It's going to be difficult when it happens.

14-00:32:26

Redman:

Did you as a family travel to Connecticut to see Jeanne's parents?

14-00:32:30

King:

Oh, yes. Jeanne much more often than I, but this how we used my airline frequent flyer miles, for Jeanne to go to Connecticut. As well, both sets of grandparents made long visits here. We did own her mother's and her step-grandfather's house for twenty-five years in Madison, and so had all of the involvement for the upkeep of it. Finally we did sell that last year, after her mother had moved into the nursing home at age 100. Her mother was pretty good up until then. There's been reason to go to Connecticut, both for the upkeep of the house and for the visiting. That family is spreading some. They're are not so many clustered in the area right now.

14-00:34:30

Redman:

Did the children often go to Connecticut with Jeanne?

14-00:34:35

King:

Well, of course, Mary Liz had college there for four years. Other than that, I think she's made maybe two other, possibly three other, visits since the college years. Catherine would go annually with Jeanne and looked forward to it enormously, given her close relationship with

Jeanne's mother. She has not gone since. It has not been such an easy thing to be with Jeanne's mother as her mind has deteriorated.

14-00:35:10

Redman:

You and Jeanne both love the outdoors so much, and Cary clearly does as well.

14-00:35:17

King:

Cary loves it a different way. He just simply wants to be out in the fresh air, working. He would rather work on a dock rather than in an office. That's the outdoors for Cary. For Jeanne and I[me], the outdoors has had a very special meaning, which is translatable to mountains and canyons.

14-00:35:40

Redman:

And this wasn't passed down to your children?

14-00:35:42

King:

No. Well, yes and no. I took Mary Liz and one of her friends on a mountain trip in 1973. They enjoyed it. She hasn't planned her own or gone back in. Georgia is different anyhow. Cary did a few of his own with friends, two or three, including once ascending Taboose Pass on his own. That is about the roughest pass there is on the east side of the Sierra. Not in terms of technical climbing, but just in terms of lots of miles and lots of up. But I would say for it to be right there as item number one, two, or three on your list of things to do, no, that we didn't pass on. Nor was it passed to me, nor was it passed to Jeanne. We just found it.

14-00:36:38

Rubens:

So your hikes in the Sierra, these backpacking trips, they weren't something you did during the children's years?

14-00:36:48

King:

The way I got into this during my formative years was summer camp and reward mountain climbs, which were not very big climbs once you've seen the Sierra. They were in the Adirondacks. Then when I came here in 1963, a colleague of about my age in the department, now deceased, Alan Foss, arranged a trip for himself, me, and Simon Goren, who was another professor of the same generation. Alan designed the trip. He had been going on trips with his friends from the University of Delaware, where he had done his graduate work, and had all of these interesting stories, including once being on a place called Darwin Bench and having had this huge, loud noise, and bounced in the air about two feet at 5:00 a.m., as one of the Nevada test site tests went off. It wasn't that that drew me there. It was the idea of beautiful scenery and totally different sort of scenery. Went on that trip, saw what the Sierra was like. Trees are not in the way of the views. You can see everything. It's magnificent. I loved every moment of it and

have been back on a trip to the Sierra just about every summer since, one way or another. We've done it in all combinations. I would do it with people from within the chemical engineering department two or three times. Then we did take a few years off from it. As of '72, maybe, started doing it again. I took Mary Liz and one of her friends in once. I took Mary Liz and Cary in once. Jeanne and I would go on some shorter trips. Then, in 1975, I discovered another way to get to do it. That was to become a Scoutmaster. That will be another whole story, but a big part of that was the annual fifty-miler, which was a nine-day trip into the mountains every summer. Half or a third of it, at least, off trail totally. Explored the whole Sierra.

Then to take the ways of doing this onward, after the scouting, I started doing it with Jeanne and me together. Then one year, as we were about the age of sixty, we decided there were other ways of doing this. There are mule packers who carry the heavy things and we don't have to. So we signed up for a trip that was being put out to the public for sign-ups by Bob Tanner, the mule packer of Reds Meadow, near Mammoth Lakes, and did that trip. Liked the way the trip went and the way of doing things. Found we would much prefer to be with friends and people we knew rather than a pickup cast of people of all sorts of different natures and interests, and so I pulled Bobby Tanner, Bob's son, aside. Bobby had led this trip. I said, "Gee, can we make up groups and sign up for these things and get you to do it?" "Oh, yes." So I've done thirteen of those since then, all with UC people.

I originally had the big ambition of signing up chancellors and vice chancellors and vice presidents to go with us, and I did that on the early trips. I had Bob and Marilyn Kuckuck [on one]. He was the associate director of Livermore, subsequently director of Los Alamos. I had Carol and Blake Keasey. Carol Tomlinson Keasey who became Merced chancellor, and I had Rory Hume one year. We have succeeded in that, but also over the years, we've sort of relaxed into our own group of people, all of whom love this and look forward to it every year. The big question at the moment is, am I going to go on the one I've already organized for this year or not? Jeanne certainly can't [because of a shoulder break this May]. We'll make a decision around July 1, when the money is due. Anyhow, that's the way we've done the mountains.

Part of taking sabbaticals in Colorado and Utah was the outdoors there, too. I became very familiar with southern Utah and northern Arizona, and so I've done a number of trips there, too. I also got involved with something called the Hardcore Hiking Club, HC-parentheses-squared—that, you can tell from the name, is composed of a bunch of chemical engineers who were at MIT at the same time as one another. They've done things like go overseas and climb Mount Kilimanjaro,

but I've only done the ones with them where they came to the West. There were three or four of those. We've done the Grand Canyon, taking the Thunder River Trail down from the North Rim. We have done Grand Gulch in Utah, which is an area of a lot of Anasazi dwellings and leavings. We have done Buckskin Gulch, which is a thirteen-mile-long side canyon of the Paria River in southern Utah, with the gulch averaging about twenty-five feet wide and several hundred feet deep. This is one where you want to check the weather forecast before you go in. You can look up there and you can see logs and stones lodged fifty feet above your head from when the water did rush through. So we did that, those thirteen miles and back up to the highway on the Paria River on another one of these. I did, starting when we were in Salt Lake, start organizing trips down the Escalante River area of southern Utah. I've been in, now, I think, four different side arms of it. I did that, taking Mary Liz and the current boyfriend, in 1978, when we were in Salt Lake.

I then discovered that another thing you can do with a Boy Scout troop is take them on spring vacation trips. So we would alternate our spring vacation trips between the Grand Canyon area [and Utah]. We've done lots of the so-called unmaintained trails of the Grand Canyon, and then also the Escalante River area within. Then the other dimension of this is that, as I retired, at least in name, back there when I left the Office of the President, we discovered we could sign up for organized trips and cruises and such things. Among the things we have done are Cataract Canyon, rafting through it. That's Moab, Utah, down to Lake Powell. Did that with an MIT group. We liked that so much that we decided we'd better do it while we still could, and we did a trip of—I think it was twelve days—through the Grand Canyon, starting at Lees Ferry and coming out at Whitmore Wash -- by helicopter, interestingly enough. Then we've also done a couple in Alaska that were rather on the wild side. We did one also MIT tour that was three national parks of Alaska: Katmai, which is the one with the bears digging the salmon out of the river, the Brooks River, and the Valley of Ten Thousand Smokes; Wrangell-St. Elias, where we were at the lodge associated with the original Kennecott Copper Mine on the Kennecott Glacier; and Denali—three days back in Denali. So yes, we do outdoor things.

14-00:46:08

Rubens:

Did you have a cabin in the mountains?

14-00:46:11

King:

We have a condo in Mammoth Lakes, which we've had since 1987. That's an interesting story. We had decided that we wanted to do this sort of thing and thought some about where to do it. Mammoth had the feature of being absolutely pristine, beautiful summer hiking country, east side of the Sierra, but it's a winter ski resort. That means there's a

community there. So to have the community and the services that came with the community was important. We bought this thing [i. e., condo] at the bottom of the market, which was one thing that encouraged us to take the jump and do it. It was the bottom of the market because the year was '87, and in '85 and '86, there had been a number of earthquakes over there and there was concern about the Long Valley Caldera doing something even more dramatic. Enough so that the town of Mammoth Lakes would even build a road as a second exit from the town, to have something in case the main road got blown up by a volcano. So prices were down, as all of this had gone on, and we bought and have enjoyed it ever since. We've had it quite a while. Now we will go there for about six weeks of the summer, the month of August—actually, late July through Labor Day. We're going to try to do that again this year, despite Jeanne's injury, and just spend the time there, the first few weeks, getting into condition, which I, at least, have gotten out of too much during the year I've been away from Mammoth. Then a week-long trip with the mule packer in recent years, and then just enjoy the place. It will interest you that, given my nature, I have also been president of the Homeowners Association there and on the board for thirteen years. I am not running again this year.

14-00:48:35

Redman:

That's what they always say! You had also mentioned your involvement with the Boy Scout troop. Can you tell us how you got started with that?

14-00:48:45

King:

Yes. Probably the way most people get started. I, first of all, had been a Boy Scout myself, in Belmont [MA], during my time there, and became an Eagle Scout. It was a troop that did almost nothing out-of-doors. I remember once going for a weekend to Lexington or somewhere, as part of the group digging a trench and sleeping in it over night. That was, I think, called bivouacking or something of that sort. That's the only thing I ever did outdoors with them, so that was no start to the outdoor career. But I did become an Eagle Scout. That was good and I valued that. It was a wonderful experience to have had, going through everything that it takes to get it.

So we were in California, and Cary reaches Cub Scout age and he joins Cub Scouts, and Mary Liz joins Brownies, and Jeanne gets involved in both of those. Then Cary moves onto Boy Scouts, and there was quite an active Boy Scout troop in Kensington. There were actually three Boy Scout troops in Kensington, if you can imagine that. Population, 3,500 or whatever Kensington is. But at that time, there were three troops: ninety-eight, ninety-nine, and 100. One hundred was the newer one. It had been in existence only about ten or twelve

years. Interestingly, early on in its existence, it had needed a Scout master and it had found one of my graduate students to be its Scout master, Peter Clark. I think I mentioned this in an earlier session. So my graduate student was doing this troop for a number of years, and I didn't get involved. On Carnival Day at the school, the Scouts would be a part of it, with the ride, and I would see him doing this thing with the troop, but that was all.

Then Cary got into that troop. The Scoutmaster was a man named Rick Sherman. Rick Sherman was a Berkeley professor, mechanical engineering. He was very good at this and very dedicated at it. He had started both the idea of lots of scouting activities, and then one weekend trip every month. He had also ventured into the world of fifty-milers and was doing High Sierra fifty-miler week-long trips of the sort that I did once I became Scout master. He had done this just two or three years at that point. I have to remember the order of events here. He decided he would leave the position. I think the thing that happened before that was I went on one of his fifty-milers, probably much to the chagrin of Cary, whose father, of all things, was going along on this trip. It was magnificent. Rick had done sort of a can-you-top-this fifty-miler. He strung together all sorts of stuff down there, going up Bubbs and Sphinx Creek, and over Longley Pass and such things. I, of course, immensely enjoyed every moment of it.

Now, what I'm trying to remember is what's the chicken and what's the egg here. I think I did that trip first, then came the need to find a new Scoutmaster. The troop committee—I was not involved with the troop committee at that point; I'd been doing other things—the troop committee came to me and said, would I like to be Scout master? I remember an interesting episode there, because I had, first of all, gotten wind that they were going to ask me. I decided this would be great. I will try to do it, and I will do it, despite the fact that I have all these administrative and professorial jobs. The chair of the troop committee, who was Hugo Sephton, contacted me and said he would like to bring a group over to talk with me later that afternoon about being Scout master. I said something like, "Oh, I'm very likely to do this. Do we really need to do this group talk?" But oh yes, that's how it's done. The group came and we talked and I agreed to do it. I did it for eleven years.

14-00:53:32

Rubens:

When did this start—what years did they span?

14-00:53:34

King:

'75 was the first fifty-miler. I started in '76 and did it through '87. Eleven years. I decided what Rick was doing was just right. There could be no better way of designing activities in a Scout troop. I was

very fortunate to have had him as a predecessor. I'll do what he did. And I did what he did. It all worked very well. The trips really draw the boys into it. That is real magnet and glue to get their involvement. The other feature of this troop, it would have between thirty and forty boys at all times, which is a big troop. Another feature of this is that scouting in those days was designed so that you did Boy Scouts for your first three or four years, and then at age fifteen, you should become an Explorer or a Sea Scout or one of those things. Our boys would just stay with the troop, all the way through age eighteen. They'd do this because they loved the outdoor trips. That was fine. I created a requirement of the Hiking Merit Badge, plus First-Class Scout, in order to go on the fifty-milers. Therefore, practically everybody became a First-Class Scout, because they wanted to do the fifty-milers. Quite a few made it through to Eagle, which was very rewarding. We just did it. It was, I think, a great success.

There are all the issues that have surrounded Boy Scouts anyhow, but what has happened is that the other two troops folded, so 100 was the only one left. That kept it going for many years. However, since my time, my immediate successor, Jim Watt tried to continue my activities for two or three years, but it didn't work. One thing you need is a lot of parental involvement, too, because if you're going to do these trips, you've got to have drivers, and drivers who do things like take a group over to the far side of the Sierra and then come back, and then go back a week later and pick them up. This is big driving. It has petered out, probably reflecting both the nature of the times and generational changes and whatnot. The troop is still there and its activities are almost all merit-badge classes, to get them going on a particular merit badge. I think the outdoor part of it has pretty much just frittered away over the years since then.

14-00:56:42

Rubens:

How long did Cary stay with the troop?

14-00:56:46

King:

He made it to Life Scout. He was there probably my first two years as Scout master, and then not there the nine after that. It's much easier with him not there, because you're not continually asking yourself, am I treating him in the right way?

14-00:57:11

Redman:

Do you still keep in touch with any of the Scouts?

14-00:57:15

King:

One of them is in the business of pet-sitting and pet care for people who go away. That is John Dey, who runs Dey and Night Pet Service, up in Kensington. John is the one who feeds our cats whenever we're away. So there's one. Others—yes, I can think of a couple of others



that I kept contact with for some years afterwards. One was Paul Meissner, who became CEO of more than one Silicon Valley company, and has a daughter, I think, who just entered Berkeley in the College of Chemistry about two years ago. There's another who got inspired to chemical engineering by the fact that I was doing it, Doug Betz, and he went off to the University of Texas and got his doctorate. I haven't followed his career since then. Those are the two I can think of. There are some other connections. It will not surprise you that I occasionally managed to get a graduate student to become an assistant Scoutmaster or a trip companion for the troop. Larry Ricker, who did that a couple of years, is just about to retire now from the University of Washington, where he's been on the faculty, and Don Mohr did this at least once, as did Tarric El-Sayed. Don is working with Chevron. I may have mentioned this before—it's through him that I have a semi-familial connection to a Nobel Prize winner, Oliver Williamson, here, because Don is married to his daughter. Tarric is now Vice President for Research at Clorox.

#### Audio File 15

15-00:00:14

Rubens:

I just have a couple questions about Boy Scouts. You mentioned "all the issues surrounding Boy Scouts." I didn't know what you meant.

15-00:00:30

King:

The gay and lesbian issue—not lesbian, but the Girl Scouts, lesbian. All of that. There's a movement now which would picture it being not a good thing to become a Boy Scout as a result of those positions of national scouting. Those issues were simmering back in my day, but my approach to scouting, what I did not do is get involved with the council people, the Mount Diablo Council people. I ran a scout troop to do what I thought was best for the scout troop. I was probably not in any way a well-behaved citizen with regard to doing whatever the policy of the day was for the Mount Diablo Council and the Boy Scouts of America as a large entity. What I was up to was to try to create a good experience, both maturing and enjoyable, for these boys, and to keep it fun for them, and to have them learn and grow. The other thing I might mention about it was sort of a philosophy of being Scoutmaster, and this was Rick Sherman's philosophy, too. The job of the Scoutmaster is to stay in the background. The boys elect their own leaders—senior patrol leader, patrol leader, et cetera—and they run the troop. You are there to pull somebody aside and talk with them if you think they need some advice with regard to how to do the leader and follower thing better. It was, in that sense, very much a boy-run troop, except for the fifty-milers. Every notice I have ever put out to a group having to do with Sierra trips, which I always end up organizing, has the words "benevolent dictatorship." A mountain trip cannot run as a

democracy or an oligarchy or anything like that. It has got to be a dictatorship.

15-00:02:52

Rubens:

I read a quote where someone asked you, “Was it difficult to deal with adolescent boy behavior?” You say—well, you’re smiling.

15-00:03:04

King:

Well, there are at least two answers to that. One is that, interestingly enough, it was not difficult. I know there are a lot of people who would think that would be just the most horrible thing there could be to deal with. I didn’t have that difficulty. I think it was because I figured out the right way to work with them and deal with them. The reason for the smile is that of course leads to another line where the greatest and most useful training I ever had from my university administrative experience was those years as Scoutmaster.

15-00:03:35

Rubens:

Oh, interesting.

15-00:03:39

King:

Well, that’s with tongue well in cheek, but nonetheless.

15-00:03:43

Rubens:

What do you mean?

15-00:03:47

King:

Well, what you have to think about, what you have to deal with in dealing with a bunch of teenage boys, is not that different from what you have to think about and deal with in dealing with a bunch of faculty.

15-00:04:00

Rubens:

What I remember you saying was that, when you were asked about any problems with the boys’ behavior, you said, no, on the trips, it wasn’t the boys that I had to deal with; it was their fathers.

15-00:04:10

King:

Well, that’s correct. Yes, there are some interesting stories surrounding fathers, probably best not gone into. I did have one leave the trip on the third day, spend a night in Bishop, decide he was thoroughly reinvigorated, come marching in over the hardest pass there is, find us the following day, and at ten o’clock in the morning, when he found us, proclaim that he was very tired and we had to stop for the night at 10:00 a.m. Other than that, no problems.

15-00:04:52

Redman:

You were also involved with the Kensington Dads’ Club, which I think was part of the—

15-00:04:56

King:

Yes, that was my first community activity. That's built around Kensington School. There's a grade school in Kensington that's always been there by itself—part of the Richmond district and a feeder to Portola and El Cerrito High. As there is a PTA for the school, there was also a Dads' Club. The Dads' Club would do things like put on the school carnival, which would occur every May. Set it up and take it down and man the booths and all of that. There was also a tie between that activity and Boy Scouts, which I could mention, too, as an aside. For many years, Troop 100 ran the breeches buoy ride at the Kensington School carnival. The breeches buoy is how the Coast Guard and the Navy get people back and forth between ships. You put a tower on the deck of one ship, a tower on the deck of the other ship, run a rope between, and here's this thing, it looks like a spare tire, hanging from the rope. The person gets in the tire, the rope gets pulled, and they go over to the other ship. So we had an old Coast Guard breeches buoy that had come down through the ages. We would put this up on the hill behind Kensington School. There's a real good lashing project to build the tower for this thing to come from. Here was this breeches buoy, and we would charge tickets for the ride. You'd get on on the top of the hill and you'd ride down this thing, gathering speed and momentum as you came down. Then the problem was how do you stop. The stopping mechanism was sort of jury-rigged. First of all, we would get tumbling mats from the Kensington Youth Hut and tie them up behind so that if somebody got through, they wouldn't smash into a wall; they'd smash into a bunch of tumbling mats. But then there was also a rope that would dangle down from the spare tire of the breeches buoy. We would have typically three people down at the bottom, each trying to grab the rope as this thing came flying down the hill at them. Almost always, some one of the three would grab the rope, and this would slow down the breeches buoy. After my time, this got proclaimed to be unsafe. And so the breeches buoy lies fallow somewhere. For many years, it was in my backyard. I don't know where it is now.

So that was the Dads' Club. It was getting into the school carnival. We also did some community projects. I remember one, building a berm, so-called, to create a sidewalk along Highland Boulevard on the south side of the school for children to be able to walk into the school, not mixed with traffic.

The Dads' Club was that. It was school activities. Well, I remember another one, which was four of us decided—how this got decided, I don't know—but we put on a show on Dads and Daughters Night. This was back in the time of the Beatles, so the four of us were the Cockroaches and each of us dressed up as a different Beatle. I was Ringo. We mouthed the words to Beatles records.

15-00:08:43

Rubens:

Was your daughter—

15-00:08:44

King:

She watched this, yes. There was also another innovation for the school carnival that came out of the Dads' Club days, and that was the Kiddie Crusher. The Kiddie Crusher was something you borrowed from the school that's in Berkeley Northside Junior High School that's right there, or whatever it is. I'd go down and get it the times we used it. It was mattresses rolled onto a rod. One for the top, one for the bottom. The two mattresses were connected to an electric motor, and this thing ran like the wringer of an old washing machine, if you've seen these real old ones that have the two tubes turning and squeezing out the water from the clothes as they go through. Well, it was the kiddies that went through, rather than the clothes, on this thing. We had only one injury on that, ever, which was when my own daughter broke her thumb going through it. But there was another interesting thing from the Dads' Club days. As you can see, I'm dangerous to the bone.

The Dads' Club was, in a way, a start for further Kensington community activities. Maybe we should go onto the community council. Kensington's an unincorporated community. It's just part of the county, Contra Costa County. It has no city government. It uses services out of Martinez. It does have a police services district and a fire department, but anything else having to do with ruling or leading or doing things for the community is done by volunteer groups. One of these is the Kensington Community Council (KCC), which, among other things, oversees the operation of after-school activities, the use of the Youth Hut in Kensington, who may use it, what the scheduling is, et cetera. I got involved in that. I don't remember why or how, but it must have been an outgrowth of the Dads' Club and connections made there. I became president of that. It was a time when, among the things we were doing, was building community facilities. We built a Tot Lot. It was actually built by one person overseen by the KCC. We built an intermediate play area back behind the Youth Hut. Both of them are now gone. It was things like that. Service projects. Of course, I then got involved in a lot more service projects for Kensington, because every Eagle Scout has to do a service project. A significant number of those were improving things in Kensington, like the barbecue outside the Youth Hut or the drinking fountain over by the tennis courts and so forth. A common denominator to this was service-type activities to the community.

It was in 1973 that I was president of the Kensington Community Council. That was the year Rick Sherman took a sabbatical leave. His assistant Scout master, who was a mechanical engineering graduate

student here at the time, Jim Short, knew me and called me up and asked if I could be sort of co-Scoutmaster with him for this year? This was two years before I was actually asked to be Scout master itself, and it was the year I was president of the Kensington Community Council, which was a fairly busy thing, so I actually said no—I would be glad to help him on things, but no to becoming co-Scout master during this time. That was the first effort to get me into scouting, so I guess it was written all over me from early days.

15-00:13:00

Redman:

Do you recall how you became president of the Kensington Council?

15-00:13:04

King:

By election. I think the size of the council was such that one of three in every incoming class of directors would become president. It's not all that special thing. The council does still exist and still does about the same thing in Kensington.

15-00:13:28

Redman:

Was Jeanne involved in the community?

15-00:13:30

King:

No, Jeanne was not involved in that. She was involved in the Parent Teacher Association (PTA) and all of the things the PTA did, including potluck dinners and lunches and whatnot. Jeanne also was a founding member of the Board of the Kensington Property Owners Association, which is a group that got formed back about that same period of time, in the '70s, to represent the interests of Kensington property owners to county government. This again reflects the lack of a municipal government. She did that for a year or two and decided that wasn't her cup of tea, and probably right then and there started into the many activities she's been involved in dealing with the developmentally disabled.

15-00:14:27

Redman:

I'm also interested—did you and your family travel much? You've of course talked about your sabbaticals, and obviously you have a busy professional life. Were you able to do much other traveling?

15-00:14:42

King:

Well, Jeanne and I would often combine something for pleasure with something that was a professional trip for me. An example was the first time either of us had been to Europe, which is back around '72 or '73. There was an international freeze drying conference. We went over to Switzerland. We did the two or three days of that conference, but extended the trip to seven or eight days and saw a lot of the rest of Switzerland. We would do that very typically with any professional meeting we went to, in Europe in particular. Then there were such things as being involved in—I think it was a meeting in Munich for a

week, and then there was going to be one after that for a week in York, England. So you don't come home for a week and go back for a week; you find something to do for a week. We had the fun of driving all around Scotland during that week. One-lane roads with bubbles—bubbles for passing oncoming traffic. The name of the game is that you and the oncoming car—neither knows what speed the other is going at, but you're supposed to adjust this in a very cool and casual way so that you pass in the bubble without anybody slowing down. I became very good at that. So we would do that kind of traveling, associated with the professional meetings.

The love of the mountains—we would get ourselves over to the Sierra one way or another in the years before we had the place in Mammoth, and take trips or work out of a motel for a few days. In the early years, we would take the children down to Disney Land over Thanksgiving. Here you can see an element of this guy, too, because you drive down on Wednesday night, a big, long drive. Get down there. You do Disney Land on Thursday and Friday. Then you're ready to come back, but there's still a weekend, and so you come up the east side of the Sierra and see what they look like in late November. We would do things like that. We did three or four of those Disney Land trips.

15-00:17:07

Redman:

When you would go off to Europe, who stayed with the children?

15-00:17:13

King:

That's a good question. There were sitters who we could engage to at least come in for some of the day. If the children were in school, that took care of that portion of the day. We also took the children with us to Europe a few times. Catherine's been to Europe a few times. I remember 1976, when we were over in Germany and we were in Heidelberg on the 4 of July, 1976, which of course was a very special day.

15-00:18:05

Redman:

But not in Heidelberg.

15-00:18:08

King:

Well, but there are U.S. troops over there, right in that area, and in that sense, yes. I think Mannheim has quite an army base. I remember driving up the Neckar River out of Heidelberg, listening to armed forces radio and all the events of the 200th anniversary. I also remember walking in for dinner in Heidelberg. You can see what we would do for food over there in Europe. We went to Kentucky Fried Chicken of Heidelberg, and went in, and my son is with us. I go out to ask Jeanne something or maybe get money out of the car or something, and I come back in and the place is in a huge hubbub, all the staff. Using a little bit of German and broken English to find out what was

going on, it seems that Cary had said something that made them think we wanted something like 500 buckets of Kentucky Fried Chicken. So we had to calm that one down. There's one memory from a trip to Europe. We would take the children very often on those things, and also on mountain trips.

15-00:19:28

Redman:

What would you say are the benefits and the drawbacks of raising a family in the Bay Area?

15-00:19:48

King:

That one can also be extended to the question of the benefits and the drawbacks of raising a family in the same place all the way through, as opposed to moving around, too. I do think there are things that I gained as a child growing up from the moving around that I saw our children not get, and that was an adaptability to circumstance and ease of doing different things. Ability to figure it out for yourself didn't come as naturally to them because of being all in one place. With regard to the Bay Area, with comparison to other parts of the U.S., a comment about myself and probably Jeanne first, and then I'll get to the children. I really think that I have been enormously productive because of the climate of the Bay Area. That's a very direct cause and effect, is that this is the right environmental temperature, humidity, et cetera for me. Now, with regard to schooling and raising a family, I think the opportunities for outdoor recreation and for a huge variety of different things to do, nothing beats it. In that sense, I think it's very mind-expanding. It gives you exposure to all sorts of different things.

The schools in our day were in transition. When we came here in 1963, I remember a magazine article with a national study that said that Berkeley public schools were just about the best in the country of any schools. I don't think you would say that nowadays, so there's been a transition that has gone on during those years. I have some concerns in hindsight about having used the Bay Area public school system all the way through on our children. I think there are ways in which a private school might have done better, particularly with regard to not leaving the child entirely on their own with regard to schooling, but instead giving them lots of counseling and guidance. I think a private school would probably have done that better. But that's big public schools. It doesn't much matter whether it's the Bay Area or Washington or Alabama or whatever.

The social activities of the Bay Area—I think the drug scene is a danger you have to worry about, and probably you have to worry about it less elsewhere. So maybe in that sense, there are too many mind-expanding opportunities in the Bay Area. I guess I would also think that it's the mother and the father and the family environment

and how it's all done that's most important. The setting is less crucial and central. The physical setting. I suppose that's a disappointing answer.

15-00:23:34

Rubens:

I think we've fleshed out, as well, right now, your personal and community life. I didn't know if we should say here how you get to Sea Ranch?

15-00:23:58

King:

Oh, it is sort of outdoors-oriented. Why don't we just do that? Mammoth is a far way off.

15-00:24:12

Rubens:

It is. It's how many hours from here?

15-00:24:15

King:

In the summer, five-and-a-half, and in the winter, six-and-a-half. In the winter, you don't have Tioga Pass, and you have to go to South Lake Tahoe and down to 395 in Gardnerville, Nevada, and then way far south. Then there can be weather in the winter. I can remember a thirteen-hour return from Mammoth once at the end of a Thanksgiving weekend. So what happened to us was this. We would initially go to Mammoth lots of different times during the year. We would go Thanksgiving. This was now after the Disney Land years. We would go the week during Christmas and New Years. We would go Martin Luther King. We would go Presidents Day weekend. We would go spring vacation weekend, and then at times in the summer. That's a lot of driving. I think we got to the point where we figured we don't want to give up Mammoth. It's been too nice, and so much of our life is centered on what's exactly there. In jobs like provost, you need the ability to get away for a weekend. That's what put the idea of something closer at hand, that was yet away, into our minds.

Then the issue came to a head in a very interesting way. I don't know if I've described this one before. When my grandmother on my father's side died, the estate was set up so that it all went to my father, except for one thing, which was written to go to me directly, which was this very remote homestead out in western Arkansas. Have we talked about this?

15-00:26:16

Rubens:

You said it, I think, off-camera. I asked you how did you—

15-00:26:19

King:

Yes, okay. So this is Scott County, Arkansas, near no city. The nearest town is something called Heavener, Oklahoma, which is eleven miles away by dirt road. Here I had this huge piece of property there that had been farmed back in the time of the Civil War, but was really not good



farming land and so it had been uneconomical to farm it. What had come to pass with the land is that it was rented for \$350 a year to the neighbor, who let his hired hands go hunting on it when they were off-duty. So I went twice, building it on professional trips to places like Dallas, and drove my four hours from Fort Smith Airport down to this place. Violated the rental car rules by taking the rental car on a dirt road. Saw it. There it was, right along the banks of the Poteau River. But we could never figure out anything for us there. There was hardly any structure on it. It is not where we would want to go for recreation. My ownership of it lasted probably a good twenty-five years. We would get the rent for \$350 and we would pay the taxes for \$350. I'd dutifully put them both on my income tax return and they would cancel one another out, so to speak, but nothing much was happening there.

We eventually decided, or really I decided, that since we could pay no attention to this, we should sell it. We spent a couple of years selling it. We ended up with a sale, and the money from the sale. The money was sufficient so that it made sense to use this section of the IRS code that says you can take money from the sale of one property and put it into the purchase of another property, provided you do it within a prescribed time period and in the right way. We contracted with the guy who makes such things happen right. Here now, Jeanne and I were in a situation we needed to buy something in a period of two or three months. Okay, what are we going to buy? One thing we've always thought about is a home for Catherine. We may still do that, although that can also come about in a different way, in that Catherine qualifies as an eligible survivor on UC retirement. She gets half of my HAPC once Jeanne and I both pass on, if she's still living.

15-00:29:21

Rubens:

That must be comforting.

15-00:29:22

King:

That's just turned our world upside down [in our plans] for Catherine, because it all had been built to the public sector before. But anyhow, we decided no, we wouldn't put it into a house for Catherine yet. We want something that we can use to get away. Well, what is there around here that we can get away at? We remembered, during my days as provost at Berkeley, we had been to the twenty-fifth anniversary dinner for the Sea Ranch, because the Sea Ranch architects were associated with Berkeley. We had actually sat right across the table from Richard Whitaker and had a big conversation with him. He was one of the four big original architects. So, okay, we'll go up and look at the Sea Ranch. We went up and looked at Sea Ranch. Yeah. Oh, they have hiking trails. It's quite natural. It's kept all that way. Houses are interesting. We prescribed an amount, which was too small an

amount, to an agent, and said, “We’re interested in looking at houses like this.”

We looked at a few, one of which was a one-room house, one fourth of which was the bathroom, with a huge blue tub and windows all around so that you could look out and I suppose others could look in as you were using the bathroom. That seemed a little crowded, the one-room house. So we went up in price, and we finally settled on one that was a brand-new home, that is not that unusual or striking or award-winning in any way, but it is the last William Turnbull-designed house to have been built at the Sea Ranch. It’s not the last design. This design had sat on the shelf for a few years before it was built. The last design is another house. The last to be built is this one. It’s a place with two bedrooms. It’s built like a box, but very interesting Turnbull effects on the interior and exterior. It was back in the redwoods.

15-00:31:41

Rubens:

Across or east of the highway?

15-00:31:42

King:

Yes, the inland side of the highway. North end, close to Gualala. Halcyon you turn up to get to it. It’s at the end of Fish Hook.

15-00:31:55

Rubens:

What year are we talking about?

15-00:31:56

King:

’98.

15-00:31:57

Rubens:

Oh, late. Okay.

15-00:31:58

Redman:

Can I also break in? I’m not familiar with Sea Ranch. Where is it?

15-00:32:03

King:

North of San Francisco. It is ten miles of the coast, from Stewarts Point, which is a nothing on the south, to Gualala on the north. It’s the northernmost ten miles of Sonoma County on the coast. Two-and-a-half hours from here. That works for a weekend, and works quite well. We’ve since found ways to make the weekends longer, so it works even better. So we have this Turnbull house. Turnbull was also one of the original four architects of the Sea Ranch. It was Moore, Lyndon—Lyndon was UC; Moore is the architect for the business school—Turnbull and Whitaker.

15-00:32:59

Rubens:

They were young, too, weren’t they, when they—

15-00:33:01

King:

Yes, that was pretty early on for them. That's correct. It's absolutely delightful. It is built so that it captures onto itself a backyard that is just left entirely natural, but it's a clearing with redwoods on all sides. There's only one problem with it, which is the redwoods. Of course, being various kinds of provost, I had to have internet access. The cable internet access did not work well in that location. Wireless is only on the coast side of the highway. All that's left is satellite, and there's only one satellite company that does not have its satellite hidden behind the redwood trees. I've been StarBand Satellite Internet's best customer for quite a few years now, as we struggle along with it. But that's nice as a place to go and spend a few days. It's not a sunny, warm climate in any way. It's coastal California, northern California, and it can be fogged in very readily. You can go for a walk out along the Bluff Top Trail, along the ocean. It can be windy as can be. All of these things happen. But still, it's an entirely different setting. We're by ourselves there. That's all good. We'll often take Catherine up there with us. The second bedroom is outfitted for her.

15-00:34:46

Rubens:

Can it be sunny on your side and foggy on the other side, or is that not—

15-00:34:52

King:

We will get the fog about ten minutes later than the other side. That's all. Because the terrain, there's a ridge right behind it, and the Gualala River is flowing on the other side of the ridge. It takes a turn, goes very north, and then comes to the coast at Gualala. That rise for the ridge between us and the Gualala River is what catches the weather. If it comes in, it will fill everything up to that ridge.

I thought you would never find anybody with a combination of Mammoth Lakes and the Sea Ranch, until I got to know my next-door neighbor at Mammoth Lakes real well, since he succeeded me as president of the Property Owners Association over in Mammoth Lakes. He's from southern California, and they spent a week every summer at the Sea Ranch. So there's somebody else who is that combination.

15-00:36:43

Rubens:

Speaking of that, did you avoid becoming any kind of representative or part of any—is there a Property Owners Association?

15-00:36:55

King:

Yes, the Sea Ranch Association is what it's called, and it does have a board. It's a different sort of association, because the buildings belong to the people. They don't do building upkeep. Nearly everything that the one in Mammoth Lakes is concerned with is the upkeep of the

condo buildings, although we also do the grounds. But no, both Jeanne and I have studiously avoided the Sea Ranch board. It is not attractive to us. Besides, why would you want to go up there for a weekend and go to a board meeting?

15-00:37:29

Rubens:

Well, that's right. I guess you spent a longer time at Mammoth, so it made sense.

15-00:37:35

King:

It took eleven years before I was willing to do it in Mammoth.

15-00:39:01

Rubens:

Let's talk about your chairmanship of the chemical engineering department. You become chairman in '72, but you had been vice chair before. At one point, you had just said offhand that the vice chair was mainly responsible for finding money for graduate students, but I thought there—

15-00:39:32

King:

There were three prime duties for the vice chair. One was to oversee, but not do, admissions. Another was to juggle a relatively small reservoir of typically \$5,000 donations from industrial companies to keep the graduate students supported. A third was the matching of graduate students with research directors. We did discuss that last one before, I know. Using the small pot to keep students supported—this relates to something that's always a problem in the sciences and engineering with regard to graduate work, which is that the government grants come in certain set intervals of not many years, and students come at other intervals of more years than that. So a professor can very easily run out of money on a grant if the successor grant was not approved or something like that, midway in a student's career. I had to use a little bit of the teaching assistant budget and this industrial budget to keep all the graduate students paid. The department lived very much as a family on that. I don't know for sure, but I would very much expect that, nowadays, that isn't done at all. Each professor is responsible for their own money, and there's not a use of departmental resources to help them over breaks in their funding. In my day, that was a big departmental aim, and everybody wanted it to happen and cared about it. So yeah, that's what I'd done as a vice chair.

15-00:41:27

Rubens:

Now, being vice chair, was that a precondition to being chair? Was it assumed you would become chair?

15-00:41:34

King:

No, I don't think so. Actually, Charles Tobias, who was my predecessor as chair, was the first to have vice chairs. There hadn't been any before that, and he created two of them. One was me and one

was Alan Foss. I've forgotten what Foss had to deal with. It may have been building and facility-type things. They came to a mutual agreement at the end of one year that that wasn't a needed job, and so Foss was no longer a vice chair. Charles kept me as a vice chair. We would talk about a lot of administrative things together. It was not a matter of me going and doing my thing. It was also a matter of just helping with the issues of the department. I think what happened is that when Charles completed a five-year term was going to step down, this became known. So what does happen is that the dean talks to every faculty member to see who they want as chair. I did that all my years as dean, for both chemistry and chemical engineering. The dean would have talked with all the chemical engineering faculty as to who they thought should be the next chair, and came to me. I think it was a matter of people just having seen me as vice chair. It wasn't any precondition, but on the other hand, it showed that I could do these things, and in a way that was helpful rather than confrontational or offensive or what have you. So in that way, I ended up with it.

15-00:43:22

Rubens:

And you were willing to—

15-00:43:24

King:

I was quite interested in that. For some reason, I had always thought administrative things would be interesting. In a sense, maybe that was a split calling on my career thoughts. The faculty was desirable, a good thing, but administration always looked interesting to me. What happened is that as I did it, I found, a) I could do it, b) people liked the way I did it, and c) I liked doing it. So why not keep doing it? That's why I was fine with the idea of becoming department chair. I think that is a rarity. I do think, given the number of department chair positions that have to be filled on a campus like this—and remember the average tenure is three to five years, so that's a lot of different people become department chairs—it's going to come to a lot who really don't want to do it, or can't do it well, or think it's a great imposition on their research. For somebody to be actually interested in it is probably the minority situation, but that's how I was and that's how I've always been.

15-00:44:38

Rubens:

For nine years, you did this.

15-00:44:39

King:

For nine years, which was a long time. Jumping to the end of that, and I realize we have lots to talk about, about the years as chair, but jumping towards the end of that, the dean—and I don't know whether it was just the dean or whether it was coming from above—well, this is a long time; you ought to think of something else to do in life. Why are you doing this for another year? I said, "I'm glad to do it if you want

me.” I would be wanted. The reason is that the department would want me.

15-00:45:12

Rubens: Well, that’s what I was going to ask you. There was no—

15-00:45:15

King: That’s what I think. They were remarkably good years that way. There was no significant internal dissension within the department. We were still back in the years where the department worked as a cohesive unit rather than being just an umbrella for twenty individually entrepreneurial professors, which is the direction we’ve gone in over the years, just by the nature of things.

15-00:45:48

Rubens: Well, I was going to ask you exactly, how would you, in general, characterize the department that you’ve come to lead? My first question was going to be, was there any other contender?

15-00:46:00

King: No. This was a department that was truly a cohesive unit. No animosities that were discernible at all within it.

15-00:46:12

Redman: Twenty faculty?

15-00:46:14

King: Yes, twenty faculty. Well, let me be a little careful here. Certainly twenty faculty by the time I got through with it. What it was at the beginning, it may have been more like fourteen when I started. It was a period of growth, too, and therefore a significant amount of hiring. Here’s an example of it. I can remember a point in time where we were going to hire our first person in the area of colloid and interfacial applied chemistry. We did a search and we ended up with two candidates. The department—and this was unusual—was split on those two candidates. About half the people favored one; about half favored another. In a totally congenial, non-animosity manner, they said, “Okay, you go away, think for two days, pick one.” Everybody was happy with that. I did it, and I picked one, and no problem. That, to me, is something that’s not happening much anymore.

15-00:47:28

Rubens: Typical of many departments, even in that period. I know sociology was particularly riven, and maybe history a bit.

15-00:47:37

King: Yes, but not this one. Maybe it was still from the era where the founding faculty had started up together. They all knew one another from the word go. They got along well together.

15-00:47:54

Rubens:

About how many students? That is both graduate students and undergraduate. Do you have a guess at that?

15-00:48:04

King:

This would be majors in the department?

15-00:48:05

Rubens:

Yes, majors.

15-00:48:07

King:

I think undergraduate, we were graduating about fifty. That has grown over the years since then, so it's about 100 now. Graduate students, we were admitting forty, forty-three, per year, and we probably had something like 150 total in residence. Those numbers are smaller now. I think the fact that it's smaller now relates to a couple of things. Well, more than a couple. One is you have so many grants and they'll support so many students, and there's a much greater per-student expense now than there was then in real dollars. Your money doesn't go as far in supporting students. The second is the post-doc phenomenon. There were virtually no post-docs in the day I was chair. It just wasn't done in chemical engineering. Now it's pretty commonly done, and so there will be faculty whose group consists of maybe a third or even 40 percent post-docs, and the rest graduate students. Those, I think, are the two biggest reasons for that change. We would have a lot of students, and we had what, for that day, was pretty big research groups. I would travel along—I think I mentioned something like ten or twelve being ordinary, and there was one point I was up to fourteen or fifteen.

15-00:49:51

Rubens:

Different research groups?

15-00:49:54

King:

That was my research group.

15-00:49:55

Rubens:

I see. I was going to paint a broad picture and then ask you about more details of the program. It's a long period, nine years. How was the department rated when you first came in? I read something from the National Research Council that put it among the top three in the nation.

15-00:50:17

King:

I think it was number three in the NRC survey of '64, if that's the right year. It's carried along in about that position. It always has ever since. The one perturbation on this really doesn't have to do with the Berkeley department; it has to do with the MIT department, which went through a period of decline for about a decade and is now right back up at a very, very high ranking, probably number one. It was the

decline of MIT that made us a little higher for a while, rather than any great change in Berkeley.

15-00:50:55

Rubens:

What about number two? What was number two?

15-00:50:58

King:

It would be either Minnesota or Wisconsin would be the other two. That's interesting, because that's unique to chemical engineering. You don't find Minnesota and Wisconsin right at the top in other disciplines. That is unique to chemical engineering. The other contender within the top five would be Delaware, which you surely don't find in the top five anywhere else, but that's DuPont.

15-00:51:27

Rubens:

I was going to ask about programs. Would you say that there were specific programs within the department? The word "research group"—I wondered the relationship between—

15-00:51:39

King:

Yes. Research group—that term would apply to an individual professor's students for whom that person was dissertation or thesis supervisor. We really did not have research groups that were collections of faculty. Chemistry did. Chemistry would have an organic chemistry group, a physical chemistry group, et cetera, but not chemical engineering in those days. The idea of research groups or departmental sub-areas or divisions, which we've never gotten to—civil engineering had it, but chemical doesn't—the idea of larger groups of several faculty really came along with the arrival of biochemical engineering on the scene, and the fact that those people had to be different, because they had to know biology, which was not part of an ordinary chemical engineering training. It was really fourteen to twenty individual faculty members and fourteen to twenty individual research groups, ranging from maybe three, for somebody who had relatively few students, up to twelve or greater for the really big ones.

15-00:53:05

Rubens:

You mentioned at one point that there was a night master's program. Was that operative during your—

15-00:53:12

King:

No, that preceded me and died out. It did not grow well. What it required was a commitment of many years by student who would hold a fulltime job somewhere. They'd come in for the course that was being given at night in a particular semester, or quarters. They then would have to do a master's thesis, which is more years. So I think it was too hard, too time-consuming, to be that attractive. We just decided there wasn't a market eventually.



15-00:53:56

Rubens:

So it ended about when, do you know?

15-00:53:58

King:

Oh, '67.

15-00:54:01

Rubens:

Also, you mentioned at different times that there was a glass shop. I wondered if there were any other fabrication shops.

15-00:54:10

King:

The College of Chemistry has always been strong on that, but that's a dean thing rather than a chemical engineering thing. Yes. There are a number of very good shops in chemistry.

15-00:54:29

Rubens:

And they remain there during—

15-00:54:21

King:

They would make practically anything. Yes.

15-00:54:24

Rubens:

They were there during your period?.

15-00:54:26

King:

Oh, yes. But the way the college is organized, as chemical engineering department chair, I had the clerical staff, which might be six people, and the graduate secretary, who would handle the graduate program administrative matters. But everybody else reported to the dean's office, not to the chair, of perhaps 200 total staff for the college.

15-00:54:56

Rubens:

Now, did you have particular goals that you—I know you at one point said that the issue was streamlining. I don't have your exact phrase here.

15-00:55:15

King:

Getting it well-oiled and humming, I suppose. There were goals that related to the time and the needs of the time. One is a carry-forward from the expanding domain of chemical engineering things we've talked about earlier. This chemical engineering department, and a lot of it was during my chairmanship, went out to new and different applications or utilizations of chemical engineering much more than the other leading departments. I think in part, that comes from the College of Chemistry affiliation, as opposed to a College of Engineering affiliation. It also just simply related to being adventuresome. Charles Tobias, this was always one of his big desires, to broaden out into other areas. I had it from that AIChE work. Anybody who wanted to do something collaborative with chemistry would probably be doing it in a new and different area. Then the bio

work was early for chemical engineering. Getting the department spread into these newer utilizations and applications of chemical engineering was one. Certainly getting the financial house in order and working right was another goal. The national ranking is something you have to pay attention to. That would be an issue with regard to what you tried to do for the people there within the department, and what sorts of people you went for for new faculty additions. I think I've said it in previous sessions, but I think a thing Berkeley did for me was to enable me to proceed in research, limited really only by my own creativity and not by other administrative or facilities-type questions. As chair, I tried to do that for the other faculty. That was really a hallmark. That's part of the getting it all humming. They are not held up by something that is operationally or administratively frustrating. They instead are limited by what they can think to do, by their research ideas. That's where you want to be.

15-00:58:19

Rubens:

I want to unpack some of this about what are the areas of new application, and then what are examples of how you're reaching out to bring in faculty that are going to raise the standings.

## Audio File 16

16-00:00:04

Rubens:

You gave an overview of what your goals were. I wonder if you could speak to some examples of what it meant to be looking into new applications and new areas.

16-00:00:38

King:

Sure. One, of course, was my very own area of research, which was chemical engineering as related to food processing, so that's one of them. The semiconductor industry was growing during that time, and Silicon Valley was happening. There was the question of what are the roles of chemical engineers in that industry, both because it was going to be important for California and there was going to be a job market for our students, and chemical engineers have always thought that they have the most useful set of principles there is anywhere, so how can they be used in some newly cropped-up area? There was a lot having to do with that. We hired first one faculty member, then another, in that area. Lee Donaghey was the first. It did not work out towards tenure. Dennis Hess was the second. He did very well indeed. The one thing that didn't work out with Dennis Hess is that they weren't from California and they did not conform to the California lifestyle, so he left here after a decade or so and went to Lehigh and is now at Georgia Tech.

How to serve the semiconductor industry? That is not just one set of issues. You get into things like plasma processing, the chemistry of

laying things down out of a plasma onto a surface of a microelectronic chip. But there are many other things in the semiconductor industry that can involve chemical engineering, too. The waste treatment from that industry is particularly difficult and employed chemical engineers right from the start. That was sort of how chemical engineers were thought of within industries, as the person to whom you hand this horrible waste, with arsenic and gallium and whatever else in it. The issue really was that chemical engineering was useful for the processing itself, and that's what our people, like Hess in particular, got into. Alex Bell, who has done much administration in that department after me, and has been dean of the College of Chemistry, he came on as a new faculty member somewhat before I became chair. His research was directed to that area of plasma processing in early years, too. So that's another one.

Various uses of electrochemical engineering, which was Charles Tobias and his co-workers. Two people who had gotten degrees with him did stay on in the department, Ed Grens and John Newman. John Newman is still there. Then John Prausnitz was off in a relatively new area. It was an old area of chemical engineering made new. The old area is the correlation and prediction of phase equilibrium properties that underlies all separations. That's the professional reason why I've had a close connection to Prausnitz all the way. Prausnitz, being situated in a College of Chemistry, identified a very promising field, being to take fundamental concepts of chemistry and use them on a scientific and theoretical basis to build predictive methods for phase equilibrium. He would go back to first principles of atoms and molecules and build forward from that, and find that he could build frameworks from that to make phase equilibrium understandable and predictable. That was a new twist on chemical engineering at that time.

Then I mentioned a few minutes ago interfacial and colloid chemistry. That had been part of chemistry, historically. At the time I was at MIT, it had gotten into chemical engineering, because that's what Alan Michaels, whom we talked about, did. It had not made its way anywhere other than MIT into chemical engineering, and so that was another field. That would lead to applications to things like paints or colloidal suspensions for this and that. Another area that came along right at that time was polymer chemical engineering. We did add some people in that area. Even though polymers are materials, and you would think, therefore, that line of activity should be in materials science and engineering within the College of Engineering, it is in fact in chemical engineering, because we went there first. Material science decided they had other perfectly good places to go and didn't come into that themselves. So building the polymer area was another example. Both in the flow of polymers and the relationship between

polymer chemistry and morphology on one hand, and the properties of the polymer on the other hand.

16-00:06:53

Rubens: You mentioned biology.

16-00:06:58

King: Bio had built up. I mentioned in one of the previous sessions how that happened, which is that Wilke simply decided to stop his very good mass transfer work, cold turkey, spend two years learning biology, and start off in biochemical engineering. So that's another one that started off in the same period of time. Yes, that was during my chairmanship.

16-00:07:01

Rubens: And you're recruiting in that area? You were looking for faculty?

16-00:07:06

King: I had to be willing to give Wilke assignments that enabled him to do this. That included letting him teach in the biological area—because the best way to learn anything, as we have discussed, is by teaching it—without giving him the burden of the standard unit operations mass transfer-type things that he had been teaching.

16-00:07:32

Rubens: I don't know exactly what phase equilibrium is.

16-00:07:37

King: Here are two different phases of matter. They might be a vapor and a liquid, or they might be two liquids that are immiscible. They don't dissolve in one another. That phenomenon is the basis of most separation processes. The idea is that you have the material that you're going to separate in one phase. You generate the other phase out of it somehow. Then the composition of that second phase is going to be different from the composition of the first phase, because the two molecules you're trying to separate, or two substances, have different volatilities, or different solubilities in an oil, or different solubilities in water. Phase equilibrium is predicting those properties on which separations will be built.

16-00:08:30

Rubens: So the applications are in a range of industries—

16-00:08:35

King: Separations are the applications. Those industries are everywhere. It's everything that does a separation. Chemicals, petroleum, petrochemicals, foods, pharmaceuticals very much, biotechnology. Not so much the semiconductor industry, except for these horrible waste streams they give you.

Purifying water, too. Waste water treatment. There are two forms of waste water treatment. One is what's done in all municipalities, which is to chew it all up with organisms and make pure water. That's not a separation, really. But the other way is through some kind of separation process, stripping out the pollutant, or extracting it out with something, or absorbing it with something.

16-00:09:28

Redman:

Did you have graduate students working with local waste water management plants?

16-00:09:37

King:

No, I did not. Where I got practical on that was the work with the EPA sponsorship, the Kerr Laboratory in Oklahoma, where those applications were water purification.

16-00:09:54

Rubens:

The other word I don't know is colloidal.

16-00:10:00

King:

That has to do with the dimensions of whatever it is. In a pure solution, like a solution of salt and water, it's transparent. It's clear. There's no second anything there. Now, let's take the extreme in the other direction, which would be a mixture of gasoline and water. Those two don't dissolve in one another, so you shake that up and you've got blobs of one phase within the other phase floating around, and very rapidly separating into two layers, with the gasoline on top and the water down below. If something is colloidal, it is a suspension, usually in water, but it is not a molecular solution. It would not be clear. The size of what's being suspended is of the order of tens of nanometers, hundreds of nanometers. Getting large enough to be seen by eye as a separate floating phase. An example would be the way soaps work. If you take a liquid soap and you shake it up in water, it is in fact an emulsion of the soap in water—particles of soap. But you look at that and it looks cloudy. The cloudiness is the colloids. Colloids are suspended very small matter that's still way bigger than molecular scale.

16-00:11:45

Rubens:

You're talking about all these elements that you identified, or areas where you were trying to expand. That meant—

16-00:11:56

King:

The department is doing this. This is not King as chair striking out on his own.

16-00:11:59

Rubens:

This is what I'm asking. I was going to ask if you are making contacts with industries.

16-00:12:05

King:

Yes, I did have a lot of contacts with industry, and that's what is eventually going to lead to the Council for Chemical Research. I had many contacts in industry. I would have a feel of the things that were wanted and of interest out there. But really, this department at that time, I was the chair of a meeting. I was truly a department chair, not a department president or head or chief. It was a matter of enabling this group of people who were able to work together well anyhow. Simply doing the orchestrating, the convening, the talking in between times, et cetera, to cause and nurture the evolving of things we wanted to do. I've done that in two ways. I've done that by running meetings and just trying to ask people to speak at the right time, or, very often, by putting questions out onto the table at just the right time. Or the other way to do it is to go around and talk to everybody individually as much as is needed, and then you know what you're bringing together when you bring it together. You know what it's going to do when you bring it together.

16-00:13:30

Rubens:

So you pursued both strategies?

16-00:13:31

King:

Yes.

16-00:13:32

Rubens:

How often did you have meetings?

16-00:13:34

King:

We would have a weekly department meeting. It was a lunch. It still happens. It had very good attendance in my day. I think it was Mondays. We used the Lewis and Latimer rooms of the Faculty Club, [appropriate for] the College of Chemistry. The meeting would occur there and the attendance would be full. That kept on. It was only since I've been back that that drifted down a bit. Now the meetings are held with brown bags in a room in Gilman Hall. People don't have that much involvement with the Faculty Club, perhaps another sign of the times.

16-00:14:18

Rubens:

Did the department pick up the lunch?

16-00:14:20

King:

No, you bring your bag.

16-00:14:22

Rubens:

Under you?

16-00:14:23

King:

No, you did it on your individual [Faculty Club] account, because you certainly had an account. You just did it, and people, as a rule, ate at

the Faculty Club. I think I may have mentioned the long table under the moose in the great hall was the College of Chemistry table. That was chemists and chemical engineers, talking all around. That's how I got to know Melvin Calvin. People were accustomed to eating at the Faculty Club. The idea of bringing your own brown bag didn't exist. That's changed.

16-00:15:01

Rubens:

In terms of how the hiring—did you have a special committee that would—

16-00:15:08

King:

We would have a search committee. The search committee would seek and receive. The word “seek” is important there. They'd go out and try to beat the bushes to get good possibilities. It would seek and receive applications. Typically, the search committee would narrow it down to perhaps six people who they thought were the most promising. Then each one of those six would be invited for a day to Berkeley, would give a seminar, which was mandatory attendance for the faculty. Mandatory not in the sense that it was met with grudging attendance. Of course you want to attend this to pick your new colleagues. Then these people would have individual, hour-long sessions with different faculty members. Probably at that point, I came into the picture and would solicit from my colleagues their thoughts with regard to these six people we had interviewed. It was usually very convergent. The episode I mentioned where I had got the choice thrown to me was quite unusual.

16-00:16:33

Rubens:

Was the committee appointed or did people volunteer?

16-00:16:36

King:

I would appoint the committee.

16-00:16:39

Rubens:

How many committees, about, were operating?

16-00:16:42

King:

I would have maybe ten committees for different things in the department.

16-00:16:48

Rubens:

Is that a lot?

16-00:16:48

King:

Graduate student affairs, undergraduate curriculum, faculty search committee. I was a one-man committee to make teaching assignments, which was really complicated. The undergraduate laboratory, there would be a committee overseeing it. I'm forgetting some other things, but typically about ten of them. You would make out committee

assignments at the beginning of the year. The chair would talk with people so they had no surprises as to what committee they were getting on.

16-00:17:32

Rubens:

So faculty served on several committees?

16-00:17:34

King:

Oh, yes.

16-00:17:38

Rubens:

You spoke about the cohesiveness and the good-spiritedness, I guess, of the department.

16-00:17:44

King:

This was not a problem. There was nobody who didn't want to serve on department committees.

16-00:17:50

Rubens:

I don't think we asked about what committees you had been on.

16-00:17:55

King:

Well, I had not been on undergraduate curriculum. I think I had been on graduate affairs because of my role in getting all these graduate students supported as vice chair. I had done admissions. That was essentially my preparation before becoming chair.

16-00:18:15

Redman:

While you were chair, were there any women on the faculty in chemical engineering?

16-00:18:19

King:

Any women? None.

16-00:18:22

Redman:

Do you know what year their first female faculty member came in?

16-00:18:26

King:

It was Susan Muller.

16-00:18:31

Rubens:

While you were chair?

16-00:18:32

King:

No. Oh, no. It would be while I was campus provost, so it's somewhere in the period '87 to '92. I regret that considerably. I had applied pressure as dean. Chemistry is also one that has been notorious for not having many women. That was just happening in chemistry during my deanship. But that's a dean topic, not a chair topic. It was during my chairmanship that the presence of women in the chemical engineering student body took a big increase. That was a very



interesting phenomenon. We may have discussed this before. It went from one or two among the fifty [undergraduate students] up to more like 20 percent in two years, in the seventies at some point. I'd love to have more discussion on the issue of women in engineering. It also relates to the engineering education interest.

16-00:19:56

Rubens:

I think what we should do is send you what I think we should still cover, regarding your chair. I'd love to talk about you being known for your calm and your ability to structure and simplify. I'd love to talk a little bit about what relationship you had to your dean and to other chairs.

16-00:20:24

King:

Yes, let's do some of that. I think also my administrative style got born and bred during those nine years as chair. I do also feel, and we can go into this, that the nine years was too long. I've always thought that the right length of time for a job is six to seven years. We should do that one on the tape. It's simple enough. You're learning for a certain number of years. You bring in your new ideas for some of those years. You don't have that many new ideas left to bring in, and somebody else would, if you had a successor. Plus—and we can discuss this, too, and it's a big contrast between me and Prausnitz as an example—I've always felt that it's good to do something entirely different after a while. Prausnitz has been. Professor of Molecular Thermodynamics for fifty years. That's been a good career.

16-00:21:28

Rubens:

Did you have a vice chair?

16-00:21:32

King:

Yes, I did, always.

Interview 8: June 20, 2011

Audio File 17

17-00:00:04

Rubens:

We're going to continue with your tenure as chair of the Department of Chemical Engineering, and then move on to your position as dean of the College of Chemistry. Just to get up to speed, we were saying much earlier in our sequence of interviews—but while you were off camera—that the rise of this department into the stature that it held, at least number three in the country—maybe that floated up a little bit at times—was quite remarkable. How did you put that?

17-00:00:57

King:

I think it is indeed quite remarkable. Again, as I think we discussed earlier, as chemical engineering departments go, this is a Johnny-come-lately. This did not start until after World War II, and all the others had started back in the early 1900s, and some even before that, such as MIT. Yet this department, with its initial hires and with what they did, by the time of the National Research Council study of quality of departments in the mid-sixties, came to the conclusion that it was one of the very top chemical engineering departments. That means that within a period of ten or fifteen years, it had risen to that stature, which is quite remarkable. I think if you did a survey of departments of this and that, of anything around the country, if you tried to find another that had risen in such a short period of time from just total inception, the beginning, to such a high ranking, you would not find it. Or there would certainly be very, very few to compare with it. That's a remarkable thing about Berkeley chemical engineering. As I believe I did say before, I think it reflects the standards of the college and department of chemistry. The fact that the department did grow out of the tradition of chemistry at Berkeley—G.N. Lewis, all of his disciples and all of that. That was brought to bear on establishing chemical engineering. I think that's a very important factor.

17-00:02:38

Rubens:

You were particularly modest, in a certain way, when I reviewed your comments that Berkeley had enabled you to do your own research, and so as chair, you wanted to do that for other faculty. The ways in which you did outreach and tried to continue to develop certain areas or develop new areas. You don't take a lot of credit for pioneering certain areas, or facilitating and really trying to capitalize on the faculty's research. So my question is, having said that, was there a certain mantle on your shoulders of knowing that this was a premier department, that it had risen very quickly? You're chair within nine, ten years of that study.

17-00:03:23

King:

Yes. Sure, I think we all knew that, that we had a department that was special and which had flourished very rapidly, coming out of the gate, and that this was something special to be maintained. This was a team effort. Not just me, by any means. It was a team. The department wanted to find the places where it could be special and could develop its own importance and its own rather unique standing. These newer areas of chemical engineering, which we went through previously, are a prime example of that. So sure, I think we were all aware of that.

17-00:04:05

Rubens:

You also emphasized the remarkable cohesiveness of that faculty. That seems like a wonderful condition in which to be a chair.

17-00:04:14

King:

It was remarkable to me. It certainly made it easy to be chair. It doesn't mean there weren't disagreements. There were disagreements, but they were disagreements that would come together and people would accept and be quite content with the product because they had seen it all happen. Everybody was very team-oriented. As we've discussed before, I think there have been some changes in academia over the last several decades that serve in another direction from that sort of thing. People tend to be their own individual entrepreneurs. The team cohesiveness within a department is less. I'm not thinking just chemical engineering at this point. I'm thinking all the departments I've known and seen over the years. I think that is probably, to some extent, or to a very large extent, even, the result of the need for individual faculty members to become entrepreneurs themselves, build their own business or empire, and be very concerned about keeping that business going effectively. It's very time-consuming. It doesn't leave much time for other things. I think that has shown up some in department chairs, too, as I've looked at it over the years. Given the rapidity with which we turn over department chairs, every three or five years, you get a lot of people in it. You get some who will still put their own research and their own business as the number one priority and just simply not give enough time to being chair. It is time-consuming to do it right.

17-00:05:51

Redman:

If I could break in—it probably was becoming very clear around the time that you became chair that this cohesiveness of the department was something that was perhaps rare and very important in the functioning of the department. How much did maintaining that cohesiveness factor into hiring decisions?

17-00:06:13

King:

How much did it factor into what I did?

17-00:06:16

Rubens:

Emily, are you talking about personality, in a way?

17-00:06:18

Redman:

Right. Clearly, you were looking for the best candidate. Were personal relationships and how they fit into the department factored in?

17-00:06:28

King:

Okay. That's an interesting question. Let me back up a little bit on it, because I do think that the fact that my style as an administrator would work well with that cohesive situation, that was surely a factor in my being asked to be the department chair in the first place. It was a factor in going on, year after year after year, for nine years, with deans looking at me and saying, "Well, your colleagues want you to do this, but gee, it's been a long time! Do you really still want to do it?" My answer would always be yes, up until the very last year, when Norman Phillips, who was the dean then, said, "Jud, this just has to be the last year. We'll turn it over to somebody else afterwards." That, of course, was the year I became dean, so we'll get to that later. I think the feeling that we needed to maintain this cohesion—it was a very valuable and unique thing. We were very aware of that, and I was very aware of that. I would see it as I would interact in one way or another with other departments and see what was going on, or find out what was going on, in those other departments. I think that degree of cohesiveness, even back in those solid days, was rather unique in chemical engineering.

17-00:07:59

Rubens:

Was there ever a point—I think you were trying to get at it—where there were a couple of candidates who looked really solid in terms of their research and filling a niche, but their personalities seemed to be more conducive to collegiality?

17-00:08:15

King:

You would think that might well be part of a decision, but I cannot recall a decision where that was indeed a factor. I did mention the time when the department split fifty-fifty on two candidates and threw the ball to me to do whatever I thought was best. That issue of who would fit in the best was not part of that decision at all. In that sense, if a certain percentage of the people will turn out in life not to be so cohesive, then we were just plain fortunate in our hires over the years.

17-00:08:53

Rubens:

How about your relationship to your dean? It's to the deans of engineering as well as to the chemistry—

17-00:09:04

King:

There are two different relationships there. Of course, we're part of the College of Chemistry. The deans of chemistry were always chemists

during my day. It would have been Harold Johnston, David Templeton, and Norman Phillips. All tended to be relatively caring deans. Just the nature of the college, the dean was sort of the principle chemist, the way it was set up and run. The function of the chair of the chemistry department was not so obvious back in the seventies, because there's the dean of the College of Chemistry, and there's the chair of the department of chemistry. It's hard to see a distinct role for the chair of chemistry vis-à-vis the dean, except, obviously, in the personnel cases, which went that way, where the department had prepared the case. The dean would receive it and comment on it. But in chemical engineering, it was different. I was the representative of chemical engineering within the college. Very often, the dealings with deans had to do with an analysis of what the current opportunities and needs in chemical engineering were, what would fit the best. There was a significant amount of explaining of the chemical engineering world to the dean that would go on in those interactions.

That said, I think they all treated us quite well. I know that the deans before my time, which would have been before Johnston, people like Connick and Pitzer, had treated chemical engineering very well, too. You could worry about that, and people within the department, from time to time, did worry about that. That chemistry is a world of science. Great discoveries are the thing. It is coming up with new knowledge. In engineering, it's different. The applications and the ability to deliver something that's very important to a particular application become important, too, but within the academic pecking order of things, engineering tends to be a bit lower on that pecking order than science. That could well be a worry, and had been a worry of mine when I came to Berkeley in the first place. How is an engineer going to fare in this world of chemists? I must say all the deans of chemistry that I dealt with in my time as chair, and I know the ones before, were very caring for the chemical engineering department. It did work well. I think we generally were able to get what we wanted and needed.

The absolutely important thing about the College of Chemistry to set us off from any comparison department within the Berkeley campus was the quality of the services provided by the college. All of these shops, other services as well. That gave us a leg up with regard to building anything or creating anything we might want with regard to experimental apparatus. That, I think, is a very special resource compared to other chemical engineering departments around the country. You asked about deans of engineering, too. Of course, that's a different relationship.

17-00:12:45

Rubens:

Let me just ask you before we move on to that, would you have regular meetings with Johnston, Templeton, and Phillips, or would it be as needed?

17-00:12:56

King:

I think we scheduled regular ones. If there was an as-needed because something urgent came up, I could always get that meeting.

17-00:13:02

Rubens:

You were saying that the role of the chair of chemistry was a little bit lower. Did you meet together?

17-00:13:10

King:

No, we never met together with the dean. That's rather interesting in hindsight. I know that does happen nowadays, because I've kept track of the current chair, Jeff Reimer, during the five years that he has been doing it. There are indeed a number of meetings of dean and two chairs, and perhaps one or more associate deans. That didn't happen in my day. It was just one-to-one.

17-00:13:40

Redman:

May I actually interrupt? You had mentioned that one of the great resources were all these shops that were already there, if I understand correctly, in chemistry. In competing chemical engineering departments, would there generally be comparable shops within chemistry, but not accessible to chemical engineering? Or were the shops in the Berkeley chemistry department just better?

17-00:14:10

King:

Both are true. The shops in the Berkeley chemistry department, and the services, were special even among chemistry departments. With regard to what a chemical engineering department at another institution would have access to as shops, I don't think they would have access to the same quality that we did. The reason would be that the chemistry department would probably be somewhere else on campus. The chemical engineers were with the college of engineering or School of engineering, and so the shops and services in question would be those of the school or college of engineering, and not chemistry. Typically, when chemistry is far removed from engineering on a campus, they either just plain don't make those services available, because there's enough demand internally within chemistry, or they price them very high. I think that was unusual for us. I had an obvious point of comparison, which was MIT. Top chemical engineering department where I'd done all my graduate work. It was night and day to compare even the machine shops. There was a machine shop in chemical engineering at MIT, but not of the caliber, quality, and capabilities of the one at Berkeley.

17-00:15:39

Rubens:

So your relationship to the dean of engineering?

17-00:15:41

King:

Yes. Well, of course, this now was a matter of the turbulent history of chemical engineering at Berkeley and the fact that there had been a program within the College of Engineering, known as process engineering, which had grown up at more or less the same time that chemical engineering had grown up within the College of Chemistry. In many ways, those had been competing programs for years, until the decision was made, I believe in the fifties, to sustain the one in the college of chemistry and not sustain the one in the college of engineering. Here is an engineering discipline that's sitting off in a different college from all of those within the college of engineering. All the literature coming out of the college of engineering has to have asterisks, saying, chemical engineering is in the college of chemistry. This can't be something that would make people within the college of engineering feel good or make the leaders of the college of engineering feel good. I knew it was a sensitive relationship from the start. Ernie Kuh was the first one that I dealt with while I was chair of chemical engineering. Kuh made overtures to me to come meet with him.

17-00:17:02

Rubens:

He was dean?

17-00:17:03

King:

He was dean of engineering, before George Maslach was still the dean of engineering in the very earliest years, but I had no interactions with George Maslach. Ernie Kuh became the dean in 1973, and that that's maybe a quarter of the way through my tenure as department chair. Kuh actually made overtures to me. Would I come meet with him? He'd love to talk with me. It was very friendly, and it was all on the grounds of how can we reinforce one another, how can we get more interactions, yet respecting the fact that chemical engineering was a department in the college of chemistry. That was really marvelous at setting things at ease. I do not believe that had happened before Kuh. Kuh was succeeded by Karl Pister. Karl maintained the same approach to chemical engineering, and I would meet with him, too. As we will find out, I have had probably fifteen different forms of interaction with Karl over the years. It was a longstanding relationship. That was the first part of it. Both he and Ernie made this work well.

17-00:18:28

Rubens:

What is the "it"?

17-00:18:30

King:

The fact that chemical engineering isn't in the college of engineering, and yet there are things where there must be interactions between

chemical engineering and engineering. The most obvious is accreditation, where ABET, the engineering accreditation agency, comes to campus. They've got to review all engineering departments. The dean of engineering is going to coordinate this, because there needs to be a single focal point for this team that's coming through to review all of these engineering departments. Well, there they all are, and then here we are over here, in Gilman Hall. That was potentially problematic. They made it work. They instruct people to make it work. It could have been a very difficult relationship. It could also have been a matter of engineering hiring neo-chemical engineers, if you will, into the other engineering departments, and thereby forcing a form of competition. That never really happened, and I give credit to the deans of engineering for that, too. There are people who are trained as chemical engineers and hold chemical engineering doctorates who are faculty in engineering, but it's not to do something that is anything close to the core activity of the Chem-E department. I think, over the years, in this era when I was chair, was probably a very important setting of the way that things would happen. Over the years, that's gotten better and better. Now there are a lot of interactions between chemical engineering and the college of engineering, far more than in my time.

17-00:20:20

Rubens:

This was a period of great expansion also for engineering, per se, right?

17-00:20:24

King:

Yes, it was. They brought in computer science and engineering. That's an odd story in itself. But yes, the college grew through the addition of the computer science. The college also got a lot of expansion faculty recruiting permits.

17-00:20:49

Rubens:

Then my question is, as chair, were you brought into the larger administrative structure of Berkeley? Were there chairs in other sort of non-science departments that you might have met with, or did you have—

17-00:21:03

King:

The answer to that is essentially no. There would be a little interaction with, say, the chair of materials science and engineering, if there was some sort of collaborative proposal being developed between the two departments. But by and large, no. Certainly I had very limited awareness of the central administration of the Berkeley campus during those chair years. I do remember one rather cute episode, which I hope I haven't said before. We'll see. That is that one of the things that I took initiative to do as chair of chemical engineering was to develop an extramural advisory board—people coming in from industry. I did



that just because I knew it would give us ties to companies. I would want to have a close tie with, say, Chevron, who was right here, or any other major company. They would be not only a source of advice as to what was going on in the larger uses of chemical engineering, but could also be of use in gaining interest or support in what they were doing from within their own companies. I did form a chemical engineering advisory board, which was mostly people of the level of vice president or director of research from—

17-00:22:30

Rubens: About how many?

17-00:22:32

King: Probably nine or ten.

17-00:22:35

Rubens: How often would you meet?

17-00:22:37

King: Annually. It started with one special meeting. We'll do that, and then I do want to come back to what launched me into this, which was the story about the central administration. There was a question, particularly in the college of chemistry, of whether it was comfortable enough for everybody to start such a thing. Chemistry, being a pure science, had not had anything of this sort. Engineering, I think, probably did have an external advisory board at that time—at the college level, it's always been. Now I'm doing one for this maverick department that's off in the other college. It took some convincing of my colleagues that this was a good thing to do. What are the fears? What could go wrong if you do this? Well, of course, in some eyes, the thing that could go wrong is that they give you advice, and then you've got some obligation to consider this advice seriously, and maybe even do it if it's a good idea. There are faculty members who would just as soon not have this on their backs. Just leave the determination of what's to be done on everything to themselves, without these additional views being thrown into the equation. So we started with a one-time only trial-run meeting of an advisory group. I've forgotten exactly what name I put on it. This was the trial-run meeting. I remember it well. It was in early June.

17-00:24:15

Rubens: Of what year, about?

17-00:24:17

King: We're going to have to look it up. I'm going to guess about maybe 1972 or three.

17-00:24:33

Rubens: So early, within the first couple years of your being chair.

17-00:24:35

King:

Yes, it was reasonably early. Certainly the idea was there from early on. We had it in early June, and those were two rainy days, which is something unusual for Berkeley in early June. Because of the importance of this group to us, I had worked through the proper levels of administration and I had gotten Chancellor Albert H. Bowker to come to lunch with the advisory board. We had a lunch in the Faculty Club, specially served. I remember that one, too, because it was some form of chicken, but the size of the bird was more like eagle. It looked like the food had come off of the football team's training table. Our eagles were delivered. We had our eagles for lunch. Bowker stands up to say a few words. Honest, this is true. He stands up and he says, "Well, it is a pleasure to welcome you all here today to Stanford" to our new advisory board. Bowker was fairly early in his time then, too. It would have been maybe his first or second year.

17-00:25:50

Rubens:

He started in '71.

17-00:25:52

King:

Okay. So '72 is my candidate year for this. Huge laughter all around the table, and then Bowker realizes what he's done. It obviously wasn't a joke.

17-00:26:07

Rubens:

You just have to remind me, had he come from Stanford?

17-00:26:09

King:

Yes, he had come from Stanford, by way of City University of New York, actually. He was fascinating. Anyhow, Bowker did well by us at that event. The department liked it all well enough, so indeed we did create a regular advisory board. It's been there ever since, with one change. The one change is that about ten years ago, it got put at the college level rather than department level. Which shows the chemists appreciate such things, too, but I think also wanted the input to look at the two departments rather than one only. If you're a dean and a department has an advisory board, that advisory board can be a pressure factor on the dean.

17-00:26:55

Rubens:

I was wondering, when you were dean, though we haven't gotten there yet, were you interested in raising the level to a college advisory board?

17-00:27:03

King:

I was not, because I thought they were better matched at the disciplinary level. Subsequent deans have raised it to the college level, and that's fine, and it works well.

17-00:27:14

Rubens:

Were you hoping for, or was part of the impetus to get money for development purposes? Or does this come along later?

17-00:27:26

King:

Sure. There was a tradition in those days that companies would give grants of typically three or five thousand dollars a year to some number of departments. If it was a company like DuPont or like Stauffer, locally, or like Chevron, that would employ chemical engineers in large numbers, they'd pick chemical engineering departments. We had, at one time, probably about fifteen or sixteen of these gifts per year, all from different companies. I register on that because there was a recognition board created that's on the first floor of Gilman Hill. It was sized to fit what was probably going to be a maximum number of companies. Now its slats are filled only in the center of the board. There's much less of that sort of giving. It's a result of something we're going to spend a lot of time with as we go on, which is that the nature of industrial interactions with the university has changed over the years, and the three to five thousand dollar grants are now, in a sense, not needed in the eyes of the companies because they do have much larger actual research project grants with the departments in question. We would give them some rights in return for these small grants. One was we would receive their recruiter to sit in a room within the department space somewhere to interview master's and Ph.D. candidates.

17-00:29:11

Rubens:

Where did the money go?

17-00:29:13

King:

The money was the flexible money of the department. That's the money I had used as vice chair to help straighten out all the finances and get all the transitional support for graduate students. We continued to use it that way while I was chair and to build it.

17-00:29:33

Rubens:

Then you had mentioned that there was obviously potential good in the advice you would get, but then you had to follow some of the advice that you may not want to. Could you speak to both ends?

17-00:29:48

King:

Sure. Well, you would get some advice that just didn't fit within the university. All it took was some conversation for the advisors and the advisees together to recognize that. There are some very specific outgrowths of that advisory board that I can think of. One is that we started a graduate level course in chemical process economics that grew very well and continued for many years. That was strictly at the advice of that advisory board. When we decided to do it, we turned to Dow Chemical, which had, at that time, a very large operation in

Pittsburg, California, with a lot of research and development there. They've now contracted the R&D back into Midland, Michigan. We had quite a strong operation technically in Pittsburg from Dow Chemical. We had already hired Scott Lynn, who had been an employee of Dow for ten years in research. As we wanted to staff this process economics course, we went to Frank Valle-Riestra, who had had a long career with Dow and who just leapt at the opportunity to create this course, and it worked very, very well. So there's one very obvious thing of value that came from the advisory board. In general, the benefit of the advisory board was less tangible things, like awareness of how industry operated, awareness of what we might do to get our research better known or informed by what was going on in industry.

17-00:31:42

Rubens:

Maintaining these contacts. Any examples of where there was a little contention?

17-00:31:50

King:

Well, the process economics [course] was some contention, because when that was first urged, probably at most a quarter of the department responded positively. I decided to push that one because I thought that was an attribute of engineering that was lacking in many chemical engineering programs. It was with my pushing and with the ability to interest Frank Valle-Riestra, who was recognized as a high-quality individual—it was those two things that put it over within the department, but there was resistance to that. That was an example of, oh my god, they recommended something.

17-00:32:41

Rubens:

Did you have representation also from any of the Silicon Valley companies?

17-00:32:48

King:

Sure we did. We've talked some about the history of chemical engineering in that industry, but even in the very earliest days, they wanted chemical engineers for processing these horrendous waste streams they have. Now, of course, they use them much more prominently in the production process. Even in those days, they did, so yes, we had some members drawn from that arena. Not just the big chemical companies and the big petroleum companies, although we had those. We tried to spread it around, recognizing these new industries. I remember when we first formed the trial advisory board meeting, Art Morgan, whom I've mentioned before, who was a good friend of the department and also doing some teaching of a very advanced course, put us in touch with the president of Campbell Soups. The president of Campbell Soups was invited to that meeting.

Then we had people from major food companies. One, typically, on the advisory board.

17-00:33:56

Rubens: I just was wondering if anyone from Fairchild or—

17-00:34:00

King: Yes. Walter Benzing is the name. He is somebody who had been a pioneer within the industry. I believe he was with Advanced Materials rather than Fairchild at the time. That is, in fact, the name of the person who was first from that industry on our board.

17-00:34:22

Rubens: That didn't represent a challenge to or sort of a conflict with engineering? I think Ernie Kuh goes on to develop his own advisory board later, so they certainly were being—

17-00:34:35

King: I'm not sure when Kuh did develop the advisory board. I know he started it, and I know Pister enormously nurtured it. I remember that.

17-00:34:50

Rubens: They weren't saying, hey, stay away from them?

17-00:34:53

King: We tried to get our one or two people [on our faculty] in this area to interact with engineering a lot, and the activity would be in electrical engineering. Electrical engineering, a great big department with 120 or so faculty members, would of course have people with very kindred interests, too. What we tried to do was to promote interactions rather than stonewalling between the two locations.

17-00:35:23

Rubens: Did you have social obligations? You talked about the faculty meetings at the Faculty Club, but did you have to host, I don't know, an annual gathering?

17-00:35:25

King: Oh, yes.

17-00:35:36

Rubens: I was wondering what Jeanne's role was.

17-00:35:39

King: Oh, did we ever. We would have a holiday party, which occurred every one of those nine years as department chair. That was not an innovation on my part, because Charlie Wilke, Don Hanson, and Charles Tobias had all done it before. It was, in a sense, the expected thing to do, and we were glad to do it. I remember brewing up some marvelous concoctions for that, too.

17-00:36:13

Rubens: At your home?

17-00:36:14

King: At our home. Had this marvelous recipe for fish house punch, which is loaded with alcohol in several forms and made a great hit. Fish house punch. We had been given a punchbowl as a wedding present, back in the time of the wedding. What are we ever going to do with a punchbowl? Here we come to California, and we have to make sure that it's all packaged in the right way so as to get here and all of that. We finally had a use for the punchbowl.

17-00:36:48

Rubens: So Jeanne was a co-hostess?

17-00:36:51

King: Very much so. Very involved. Did a lot of the concocting of the food elements of this, and there were plenty of food elements. We had plates all over the dining room table, with people milling around. Did all of that.

17-00:37:09

Rubens: I assume when faculty recruiting was taking place, that's part of the job, to take them out to dinner?

17-00:37:18

King: Yes. Typically, though, you would do that at a restaurant with two or three of our faculty there, sort of honing in on them with all kinds of questions. That is, it was an interview session, not a social event.

17-00:37:38

Rubens: Were there endowed chairs at this point that you had any—

17-00:37:42

King: There were not. There were zero. There's an interesting story there, too. Endowed chairs had been discussed, both in chemistry and chemical engineering. The sort of usual reaction, or the party line, was that we have so many superstars, we would destroy this collegiality by having an endowed chair, or two or three endowed chairs, and thereby having singled out some one, two, or three people above all the rest—we can't do it. That attitude pervaded the college for many, many years.

17-00:38:24

Rubens: The college?

17-00:38:25

King: That endowed chairs would be a negative. Yeah, it was a college issue more than department issue. In my day, other than the industrial liaisons and the effort to get the three to five thousand dollar grants,

there wasn't any fundraising, per se. When we did start it at the college, it was after I was dean, and it was at the college level. But in that day, practically none in chemical engineering.

17-00:38:59

Rubens:

Should we talk about here that in 1976, after being chair for four years, you do form a permanent relationship to LBL?

17-00:39:12

King:

I really had one all along.

17-00:39:14

Rubens:

Yes, but something changes, no?

17-00:39:17

King:

Probably if we looked at my graduate students, at least 50 percent were supported through LBL. We discussed in the earlier interviews how I had start-up monies through LBL and Iz Perlman's program there. There was a lull of three or four years, and then as the Lawrence Berkeley Laboratory started up its energy and environment program, which we have discussed and which was in the early seventies, we then moved to where that made an avenue to other parts of the Department of Energy, and you could therefore get research support that way. I was part of the energy and environment division from the word go, and did receive a lot of support from several different arms of DOE over the years. That was very important to my research. There was one point in time during that, and I'm not going to remember the years well—it was after Elton Cairns was hired as head of the energy and environment division, and I had been on the search committee for that. That's an interesting story, come to think of it. Let me do that story and then come back to my modest role.

One not so modest role was that when the Lawrence Berkeley Lab decided to have an energy and environment division as a division of the lab, there was a very substantial search committee and search for a new head of that division, a first head of that division. That was not a small step within LBL, because it had been physics, accelerators, Lawrence's work, et cetera, and now here was going to be a division that wasn't a science. It was a large application, energy and environment. Should they do that? Is that as distinguished science as the other types of science? Et cetera.

17-00:41:25

Rubens:

When are we talking about?

17-00:41:33

King:

It starts about 1973. It's contemporaneous with the Arab oil embargo and the interest of Art Rosenfeld and other people within the lab in getting going in this. We did do a search and recruitment, having

decided to go outside the laboratory and bring in somebody else. I had a very major role in that search committee. I remember we came very close to hiring one of the pioneers of biochemical engineering, who had been at Columbia and then at Vermont as dean. We then went with Elton Cairns, who was a graduate of the Chem-E department at Berkeley before my time. He was a Prausnitz graduate who had had a very distinguished career at General Motors—again, an unusual application of chemical engineering. He worked on batteries and fuel cells, and still does. He was hired as the director of that division. Then as the years went on there, he made the decision that there should be—I think it was five different distinct programs within the division. One of them went by the name chemical engineering, which was going to collect everything that had to do with chemical engineering people. He needed a program head, and leaned on me heavily to do that. I said, “Look, I’m a department chair”—or maybe I was dean, but I think at this time I was a department chair—“Why don’t you get somebody else to do this?” “Oh, no, I need you so much.” So I did that for two or maybe three years.

17-00:43:16

Rubens:

This was called the chemical process program?

17-00:43:19

King:

Probably, yes. Chemical processes program. Which was actually a rather interesting way to get some connections outside of chemical engineering, because we had a group of the five people who ran these different programs and we would meet every week or every two weeks. The others were not chemical engineers. They were different sorts of people. One, whom I came to know quite well, was Will Siri. Will Siri headed the energy conservation program initially at the lab, which Rosenfeld was in. Will Siri, of course, to my hero-worshipping mind, was even more importantly something else. He was deputy leader of the 1963 Americans on Everest expedition: the expedition that resulted in the book “Americans on Everest” by James Ramsey Ullman. Of course, I had read this book avidly. It was full of beautiful pictures. I had been to a presentation, I think by Siri in Wheeler Auditorium, showing all of these beautiful pictures up on the screen. My gosh, here I was, now dealing with him. We kept a friendship going for years. In its own odd way, that was a way of getting me out of my chemical engineering cocoon a bit early on.

17-00:44:58

Rubens:

Because you were chair of the chem-e department, is that how you got onto the search committee?

17-00:45:04

King:

Well, and because of my research. Separations consume a lot of energy.



17-00:45:15

Rubens: You'll keep that affiliation?

17-00:45:18

King: All the way. My last graduate students—I think the last one graduated in 1999. They had all been supported through Lawrence Berkeley Lab. Excuse me. There were three at the end. Two were supported through Lawrence Berkeley Lab. One was the remnants of my last NSF grant on drying.

17-00:45:47

Rubens: We talked about your developing a certain administrative style that was to promote consensus. You had an even temper. We did talk about one incident—?

17-00:46:00

King: The once incident that you have in mind might be the demonstrations that come through after the hydrogen plant, wanting to rip down everything in the building. We had the faculty member who kept threatening to turn the fire hose on them. It never happened, and therefore that was more something that could happen rather than something that did happen. Continue with your question.

17-00:46:22

Rubens: Is there any other incident that really challenged you or raised your hackles a bit?

17-00:46:28

King: There are plenty of things that have challenged me in all capacities I've been in, and even which raised hackles, but my natural inclination in such circumstances is to think harder and not let my emotions run away with me. That is a characteristic of my administrative style. If somebody's come into the room and is intending to get me into an emotional fit, it isn't going to happen. I seem to have a capacity to just wrap my mind around whatever the issue is and focus on the issue and dissect the issue. My doing that comes across as a calm demeanor.

17-00:47:14

Rubens: Is this a good segue to becoming dean of the college? Do you think we've covered most everything from the chair years? So you become dean of the college in 1981. I don't know if you were thinking about not taking on another chairmanship, but you said that Phillips—

17-00:47:36

King: Norman Phillips was telling me that this absolutely had to be my last year. That the campus just never let anybody go this long as chair, and what was I doing liking it, anyhow? I shouldn't do that.

17-00:47:48

Rubens: How did you respond to that?

17-00:47:51

King:

I said, fine, if it's my last year, it's my last year. It was still a situation of my colleagues, when interviewed, very much wanted me to do it. As best I knew, and I think I'm correct here, he was taking that stance against the collective desires of the faculty.

17-00:48:07

Rubens:

Did he have in mind that you would succeed him as dean? How did that come about?

17-00:48:14

King:

He may have had that in mind. He never said that. Well, he actually did say to me that he thought I would be an excellent dean to succeed him. I remember him saying that once. But there is another way he sort of paved the way on this, too. It relates to the fact that laboratory space is, of course, the core need for any experimentalist within chemistry or chemical engineering, and the college was tight on space. The college had had an enormous burst in space expansion in the early and mid-sixties, as Latimer Hall, huge building, was built and came into use, and then Hildebrand Hall a couple of years after that. That had given the college of chemistry a lot of additional space all at once there. We had, by 1980, gotten to the point where that space was used and packed pretty full, and space was a rare commodity. Looking ahead to when I was dean, that was probably the single largest, most continuing issue I had, was availability of space for different things. I'm sure it was for Phillips, too.

Phillips actually pulled me aside. This would have been probably the summer of 1980, or the spring of 1980, and said, "Look, we have got to have more space for this college. I think it's going to have to be a new building, but the way to get going on that is to have a study of existing space and an analysis of space needs for the college. I want you to chair this committee." He would appoint the rest of them. He would discuss with me who would be the others appointed to it. So it was sort of fitted to me, if you will. Then he says, "By the way, you are to recommend a new building. And furthermore, I think," says he, "that that new building should be occupied by chemical engineering." That goes back to another long piece of history in the college, which is that in the giant building wave of the late fifties and early sixties, there was unit one, unit two, and unit three was the plan for the college of chemistry. Unit one became Latimer Hall. Unit two became Hildebrand Hall. Unit three, which was supposed to be on the site of what is today Stanley Hall, never got built because there was some great downhill turn in the state budget for building buildings. He brought up that old chestnut, that unit three, after all, should eventually come into being, and chemical engineering has never had new space. Well, how could I object to this? So I did chair that in my last year as department chair. Remarkably, the committee did recommend the need

for a new building. I gave all of the supporting arguments for it. I think he had actually helped me position myself some for this dean position. However, there were other candidates, and strong candidates.

17-00:51:46

Rubens:

Were you the only candidate from chem-e?

17-00:51:50

King:

Yes.

17-00:51:52

Rubens:

How did candidates emerge?

17-00:51:55

King:

Well, what happens when a dean is to be appointed, there is a search committee. That search committee is appointed by California Hall. If it was within the professional schools and colleges, it would be appointed by the provost for professional schools and colleges, who has gotten input from the budget committee of the senate and has worked with that, plus his or her own judgment. That search committee then meets. Among the members of the search committee, they talk to all members of the faculty within the college. They have that input. Equipped with that input, they then make a recommendation to—in those days, it would have been the provost for professional schools and colleges, who, at that time, was Doris Calloway. Doris Calloway would receive the recommendations of the committee. The rules of the game were always that the committee can say whatever they want to say about people, but they must recommend at least two people. They cannot recommend only one person. They can put whatever verbiage they wish around that, but they do have to give more than one name. These names are then received by the provost of professional schools and colleges, and knowing how the place worked then, in hindsight, she would have shared the issue with Mike Heyman and Rod Park, who were the Chancellor and The Vice Chancellor, with a capital “T.” They would have jointly come to a conclusion as to who to select. Obviously, at least one chemist’s name was submitted along with me.

17-00:54:05

Rubens:

Did you know who that was?

17-00:54:07

King:

I did know who that was, yes.

17-00:54:11

Rubens:

Are you asked if you’re willing before—

17-00:54:17

King:

I did interview with the search committee, and so would other candidates, probably four or five, as part of it. You’re asked during

that interview if you'd be interested. Doris, Mike, and Rod, in whatever combination, but I think it was primarily Doris, settled on me. I do remember one line in her initial meeting with me. She had her own very interesting history within the chancellor's office. In fact, she was a remarkable person. She was a professor of nutrition. She had not had any other administrative posts that I know of before becoming provost.

17-00:55:00

Rubens:

Not chair or—

17-00:55:03

King:

She probably was department chair of nutrition, but she'd not been dean of that college. I've read Mike's oral history, Mike Heyman's. He very much wanted Doris and did what he could to see to it that things would come out so that she was in that position. She called me in and said she would like to appoint me as dean. As we went through the conversation, she did indicate that of course she was known as an affirmative action type of provost, and she was pleased to see that this would be an affirmative action type of appointment, to put a chemical engineer in as dean of the college. I think that idea really appealed to Doris. I don't think that's the only reason I'm there by any means, but she did make that remark to me, which I've remembered well and found sort of amusing at the time. This then had me selected to be dean of the college of chemistry, starting July 1, 1981.

There's another interesting feature of July 1, 1981, which is that that was the point in time where the university had just been through the process of differentiating certain salary scales within the faculty salary scale. They had differentiated business and they had differentiated engineering. This was a big issue. If you differentiate the salary scale, and the salary scale becomes higher for some breed of professor, then everybody who has a faculty appointment within that category that's being put on the special scale gets an increase. The big issue at the time was whether this should be done on a wholesale basis, where entire departments were put on a new salary scale and everybody's salary moved, or should it be done on a merit basis, such that you would have a merit review, and if you did well enough in the merit review, then you got onto the new salary scale. That had been a huge issue on campus.

17-00:57:30

Rubens:

Where is this emanating from?

17-00:57:33

King:

This, I think, had its start from the deans of business and engineering. Where it became interesting was in the college of chemistry, where one department, the distinguished department, is not going on the

higher salary scale, and this Johnny-come-lately engineering-type department is going on the special salary scale. That came into play on the same day I became dean, which was July 1, 1981. That was interesting for me, because that issue was hung around my neck as I entered the deanship.

17-00:58:13

Rubens:

Are you privy to this discussion while you're chair?

17-00:58:17

King:

The salary scales? Oh, yes. That was decided in a very formal way.

#### Audio File 18

18-00:00:00

Rubens:

We were talking about a committee to recommend differential salary increases. Was this a committee of the college of chemistry?

18-00:00:24

King:

No. It was a committee of the college of engineering. The two entities that went on special salary at that point were engineering and business. Medicine, of course, has forever been on a totally different kind of salary plan, even, where their practice compensation is part of it. Law had been on a special scale for some years before. The idea here was that engineering and business should be on the special scale, and the reason being that the job market competition was such that they needed higher salaries to meet the market. Yes, there was a committee that was appointed, I suppose, by the dean of engineering, who would have been Karl Pister at the time, that had four or five of us on it, to devise or recommend a policy for engineering. I remember that in part because it was when I first got to know Tom Everhart, who was the chair of the department of electrical engineering and computer science at that time. I found him to be a delightful, enjoyable, and very pleasant individual, and was shocked when he left Berkeley about a year later to go to Cornell as dean of engineering. He's had a subsequent career that includes being chancellor or president—I forgot which it is—of the University of Illinois and president of Caltech. I still see him. That was when I first started dealing with him. That committee was to recommend some parameters for special salaries in engineering. One of the issues, as I mentioned towards the end of the old tape, was this one of whether a special salary scale should differentiate everybody simply because they were in the discipline, or whether it should allow higher salaries when recommended in a merit review. The difference being the relative non-performers, would they get the special salary or not?

18-00:02:26

Rubens:

Is this committee mostly engineering?

18-00:02:29

King:

It was all engineering. I was there because chemical engineering is engineering. There's an example of a dean of engineering bringing me from chemical engineering into something that was an engineering issue. This had gone on in engineering and in business, and I'm sure there were immense deliberations at the center campus level, which I knew nothing about. It was eventually decided that just being in the discipline would put you on the special scale. Going back to the first day that I was dean, that was the day all the chemical engineering salaries took a jump, and all the chemistry salaries did not take a jump. Our college was the one place this issue arose within a college in a way that would not apply to the whole college. Eventually, economics has been put effectively on the business scale, and that's a similar issue, because it's within L&S. But at the time, it was just the College of Chemistry where this applied differently to different portions of the college.

18-00:03:42

Rubens:

Were there protests amongst the faculty in chemistry?

18-00:03:45

King:

"Grumbling" is the word I would use.

18-00:03:49

Rubens:

I'm missing just one little piece. You're advising the college of engineering. I assume you recommended for this?

18-00:04:01

King:

Sure.

18-00:04:02

Rubens:

Not based on merit, but based on—

18-00:04:04

King:

I think we did recommend that it be the differentiation by discipline. I'm fuzzy on that, but probably we did.

18-00:04:10

Rubens:

But as chair of chem-e, you're also promoting this, is that right, to central campus?

18-00:04:17

King:

Sure. I certainly didn't want chemical engineering left out if it was going to happen. Then I ended up being dean of the college of chemistry on the first day it came into being, so I had to deal with the feelings that had resulted from that.

18-00:04:33

Rubens:

Did you have to do some care and nurturing?

18-00:04:38

King:

Just dealing fairly and squarely with people served to take care of whatever residual issue there was. Some people would start off conversations with a grump on the subject.

18-00:04:54

Rubens:

Did Phillips hand you a game plan? I want to ask, ultimately, did you have your own goals and agenda, but were there some—being as close as you were to—

18-00:05:07

King:

No, Phillips did not hand me a game plan. Other than the fact that he had set it up with this committee to study the space needs, and the committee had recommended the building, so it was the chair of the committee that recommended the building now becoming dean. Of course I'm going to promote a building. The building was the number one thing on my agenda, but I recognized that there had to be something else that would be just as high that had to go along with it, and that was the college had no development operation whatsoever. Other colleges and schools did. Business had a very successful development operation at that time. Law had one. That had been a vector of Karl Pister during his time as dean of engineering. He had already been dean for several years. He had developed a development office. We had nothing in Chemistry, and yet here I am talking about a new building.

The other complicated thing about this situation is that this is contemporaneous with the biosciences reorganization at Berkeley, which had been a huge central thing. Probably the number one initiative of Mike Heyman and Rod Park was the reorganization of biosciences. The reorganization took a myriad of departments down to three departments and reorganized in that way, but part of what was being done was also a recognized immediate need for major, major building facilities for biology. As I started off on my building project, here were units one, two, and three of biology buildings already defined, and standing right at the top of the list for state funding. Those eventually became the life sciences addition—the first one—the redo of the Life Sciences building, which was a huge project, and the plant genetics building, which is now Koshland Hall. So all of those were clearly the priority for state money, and there was not a way to break into that. It was very clear that there had to be a private funding component to a chemistry building. How much, I had no idea. Had I raised any money before this? No. Did I have a realistic view of what development needs and opportunities were? No. But I certainly saw the need to start on it.

So quite early on in my deanship, I did identify the funding for and do a search for a head of development for the college. That was an

interesting one, because if you look at this from the standpoint of people in the development world, it's a fairly ordinary, not so high position, except for the very distinguished nature of the College of Chemistry and what that offers a development person to work with. We did this search. I had a number of people come through. I came to know what a fairly conventional development officer looked like. I thought these people were too much of one mold and there wasn't a lot of creative thinking. It was just, this is how you do it, and I will do it for you.

18-00:08:58

Rubens: Were these young people primarily?

18-00:09:00

King: Yes, mostly. Yes. It would compete with other entry to next-after-entry-level jobs. At some point rather early in this game, but during it, Gabor Somorjai, a professor of chemistry, came to me and said he knew this very capable person that was moving up from San Diego, Jane Scheiber, and her husband was Harry Scheiber, who was being recruited into the—

18-00:09:35

Rubens: Law school.

18-00:09:36

King: Well, the law school, but the—

18-00:09:38

Rubens: The Center for—

18-00:09:41

King: The not so legalistic portion of the law school; Jurisprudence and Social Policy portion. So I interviewed Jane Scheiber, who had no development [background] whatsoever. I thought: this is a sharp person who can stand up well intellectually with the College of Chemistry, and is going to be able to do more with the chemistry faculty and be respected by the chemistry faculty.

18-00:10:14

Rubens: What was her background?

18-00:10:16

King: A writer. She had done publications at San Diego. She also does some collaborative research with her husband on ocean law. I figured, well, let's go with the person I think is the capable person rather than the person with the training. I then talked with the people in development here. That probably would have been Curt Simic, because development for the campus was a pretty small operation then, although that had to gear up fast, too, because of the biosciences buildings in the first campaign. I found how I might be able to get a



consultant who could work with Jane, and I found out where was fundraising school to send Jane to. So I took Jane on with that understanding.

18-00:11:08

Rubens:

Where did the money come to pay for her?

18-00:11:09

King:

I had just simply squeezed it out of the state budget. I don't think I went to Doris and asked for a special allocation for it. I may have, but I think I just simply said, this has to be done, and got it out of the budget in some way. So I took her on and she went to fundraising school. We had the consultant, and the consultant lasted for one month, and then it was obvious he wasn't needed at all. Jane, until two years ago, was the development person of the college of chemistry.

18-00:11:46

Rubens:

When did money start coming in and where from?

18-00:11:48

King:

Okay, so now we've got a building project, and what priority is this? The building project has got to have priority on the campus's building schedule vis-à-vis other projects. It has got to have funding. The conversation with regard to the funding on this building between me and Mike and Rod—and I would make presentations on the building to the two of them—the conversation would go back and forth with regard to how much state funding, how much private funding. I think we were all neophytes at this business of private funding of buildings and didn't quite know how to size it up well. I'm sure that Mike and Rod had our fundraising prospects sized up by Curt Simic and possibly by outside people. We went back and forth, and at various times this building was going to be all private. At other times, it was going to be all state-funded. And at other times, it was of various fractions. The running joke in my mind, in my conversations with the people in the college, is that it changes from week to week, what this building is going to be. Nonetheless, it's not going to be all public funding. I think we can be sure of that. Therefore, we have to start raising money. Again, to show you how small the development operation was on campus at that time, I think the central development office had about five people in it. Simic had been here for about a year but no more, and he was the first person hired as an honest-to-Pete development-trained vice chancellor—

18-00:13:33

Rubens:

Heyman does that, right?

18-00:13:34

King:

Heyman did that, yes, with the idea of the biology buildings and the need to build a capital campaign around those biology buildings. We

should get to another aspect of that, too, which is the question of who was going to control what within the development world on the campus. Let's go a little further on our building first. I had gone and had lunch with people from Stauffer Chemical. There was a Stauffer Chemical operation here in Richmond that is since defunct, but it was quite a substantial chemical company at that time. It happened that the vice president of Stauffer Chemical, headquartered in Connecticut, was Harold Mickley, who had been a professor of chemical engineering at MIT while I had been at MIT. So Harold Mickley comes to town. We have lunches with Harold Mickley. Stauffer gave—I think it was \$50,000 to start off this project. The price was going to be way up there, in the huge number of millions. Sixty or more. So here was \$50,000 to start with.

Then, going back to the small central development operation, one of those five people was a guy named Mike Romo. Mike Romo was a young fellow, just starting off in the development business. His mother and father lived down in San Marino, near Pasadena. They had a dog whom they would take to the vet's office. In the waiting room of the vet's office, his parents had met Ross and Irma McCollum. Ross and Irma McCollum were in there with Pat and Mike, who were two Irish Terriers. The conversation started in the waiting room at the vet's. Oh, Mr. McCollum was a graduate of the College of Chemistry at Berkeley, and Mike Romo knew Jane Scheiber, who was working now with the college of chemistry. Mr. McCollum had started an oil company upon graduation in the Bakersfield area and had been successful. He sold out his oil company and was a donor of some note. Indeed, there are Ross and Irma McCollum chairs at Caltech. He had been very closely tied to Caltech, where he had done, I guess, his graduate work after his chemistry undergraduate work [here].

Romo had gone to see the McCollums. Comes back to Jane and me and says he thinks he's got a gift coming from Ross and Irma McCollum. So I get background on them. Jane and I fly down to San Marino and go to visit the McCollums, along with Mike Romo. Irma greets us and brings us in. You have to know at this point that the McCollums are ninety-two and ninety-three years old at this point. We start having a conversation in the living room. Pat Mike on the head. Within five minutes, Ross gets to, "Well, I really did value what I got from the College of Chemistry. I'm going to give you a tenth of my estate." Oh, that's very nice. Thank you, Ross and Irma. I thought to myself, my, this is easy! They set all this up for you, and then you go down for the visit, and in five minutes you've got the gift. Of course, it never happened that way again. We do have, in Tan Hall, which is the result of this building project that has now materialized, a very handsome room on the top floor, with a bay view and a terrace and

everything, named the Ross and Irma McCollum Room, that results from that gift.

18-00:17:45

Rubens:

How big was that gift in the end?

18-00:17:48

King:

We didn't know until it materialized. It was some millions, a small number of millions, I think. The other interesting thing about Ross is that he was the conductor of the Los Angeles County Sherriff's Rhythm Posse, which was a musical group. He proudly gave me a tape of the Sherriff's Rhythm Posse to take back with me. Of course, we dutifully listened to it. Not so many times recently, but nonetheless, we dutifully listened to it back then. It's jazz music. Very nicely done. Apparently had some distinguished members of this posse. One of them was Henry Cuesta, who, if you dial into the public TV channel and you see Lawrence Welk on Saturday night, there's Henry Cuesta, sitting there, playing his clarinet. He was a fairly well-known clarinetist in the day. He played with Ross. That's off the subject. Anyhow, a very warm and nice story there for the first really sizeable gift for the building. As I say, fundraising was never as easy as it was that very first time.

The thing I skipped over and said I wanted to come back to, and I'd like to say a little about, is the issue that was going on at the level of the deans and the chancellor on fundraising. Mike Heyman inherited a very difficult situation here. He had successful operations in at least business, engineering, and law. He had no central fundraising operation of his own, and yet he wanted to raise big bucks for big biology buildings. How was he going to do that? He did have several meetings with council of deans, or professional schools and college deans, since all the ones with operations were professional schools and colleges. It was sort of knock-down drag-out. The question was, really, could Mike have access to the leadership and the big donors that had already been established by these units within the campus?

18-00:20:23

Rubens:

Are you dean at this point, when these meetings take place?

18-00:02:25

King:

I am dean, and I'm in an odd situation, because I'm a dean who wants to start a fundraising effort, not a dean with a big fundraising effort. This is a little different. Being in my situation, I could see a central operation being more helpful to what I needed to do than these established operations would see it. So there was a lot of tension then on this very subject. It ended up that that first capital campaign on campus did draw much of its leadership from the business school

friends and leaders, and so Mike did succeed in that, but that was a very tense and difficult situation between him and the deans.

18-00:21:15

Rubens: I want to get to that relationship with the deans, but let's stay with the building just a little bit further. At what point did you have plans for the building? When you said—

18-00:21:26

King: That was another thing you had to do as part of startup, was to see when you could get permission from the central campus approval authority for the various stages of building design. I'm going to have to scratch my head a bit to remember what name goes with what stage, but let's say preliminary design, or conceptual design, is the first stage.

18-00:21:49

Rubens: That's done by campus, not by—

18-00:21:52

King: Well, no. You hire outside architectural assistants to do that. For a project of the size of what we were talking about, what became Tan Hall, that's bigger than the campus in-house capability felt that they could do. We did have to take on a firm for the initial conceptual design.

18-00:22:20

Rubens: Was that time-consuming? You had to review what's available and select somebody.

18-00:22:29

King: The selecting was really done by the central people. Campus engineers and architects, the ones who were in that little-bitty building, would be the ones who actually select the firm to do it and who have the reservoir of knowing who can do it. However, in our case, there was a firm that had somehow found out about this incipient project and became very interested in it early on. That was a firm named Stone, Marraccini and Patterson. The vice president of that was Mike Kelly, who lives, I think, close by to the campus. In fact—this is an aside—I've wondered in recent years, when I discover that the Panoramic Hill Association's leader is named Mike Kelly, if that is in fact the same Mike Kelly. I do not know the answer.

18-00:23:25

Rubens: John Cummins may know that.

18-00:23:27

King: He may. But anyhow, Mike was very interested in this. He came and did what was probably the smart thing—came and met with me and some other principals of the college, just to find out about our interests, needs, and so forth. That did indeed result in our speaking

favorably about the possibility of that firm, which had just done the big San Francisco hospital, the one that is just west of the big curve around Army Street on the 101 freeway [“Hospital Curve”]. I’ve forgotten the name of the hospital, but they had just done that. It was new at the time. They seemed to have the capability and the knowledge to do our type of building. They eventually became the architects for the whole project, but they started off early on doing this conceptual design study.

So that raised questions of what site and how to treat the site. We got funding for that study, which probably ate up much of what I had raised. I don’t think there was central campus funding in that. There may have been a cost match. I don’t remember. The Unit Three site, over at Stanley Hall, was now felt not to be available. That was further than the reach of chemistry should be. Of course, that’s now this huge, new Stanley Hall that has been built for QB3. We had to work with the site that was a parking lot at the time, which had been the Crocker Laboratory, which had been part of Lawrence’s work--old, temporary type buildings. They had been taken down and it had been made into a parking lot, and was the corner between Gilman Hall and Latimer Hall as those two axes came together. That turns out to be on the minor John Galen Howard axis of the campus. The major axis is the one that Evans Hall sits in the middle of it properly. The minor one is this one running up between Gilman and LeConte, and ending up at the Mining Circle and the Mining Building on the other side of the Mining Circle. That had to be treated specially from the standpoint of campus design.

Therefore, we had constraints of a sufficient match to Campbell Hall, which would be across this minor axis from the new building. We had a not very big footprint to work with for where the building would go. We had the fact that the building had to be at least as tall as Latimer Hall, since it would release effluents from fume hoods at the top of the building, and they should not go into the eighth floor of Latimer Hall. They should be released well above the eighth floor of Latimer Hall. There were lots of constraints on the site, and that all went into the conceptual design. From that, we came up with the conceptual design, which was Phase One. Another interesting aside here is that we now have a project to take down and rebuild Campbell Hall. I’m sure that a constraint on the rebuilding of Campbell Hall will be that it match Tan Hall, as Tan had to match the original Campbell.

Then we went to the second phase of the design of the building, and that represents more seriousness with regard to it actually happening. Therefore, it took quite a bit of discussion and presentation and convincing to get that moving. During that period of time, what would be the funding recipe still kept floating back and forth. I think when I went out of the picture as leader of the project, which would have been

when I left the deanship and went to the provost position, that it was targeted for fifty-fifty still: fifty percent state funding, 50 percent private funding.

18-00:28:00

Rubens:

So the discussion starts in '80, '81, and then it still—

18-00:28:06

King:

It consumes my entire deanship, which is six years.

18-00:28:09

Rubens:

We're not getting a building. We're getting—

18-00:28:10

King:

No, we're going along the steps towards a building. As I went out of the picture, the final architecture had not been started—the final architectural plans. The second phase of—you would have to look up the names of these phases—but more definitive design of the building had been done.

18-00:28:32

Rubens:

Had it been named?

18-00:28:33

King:

No, no.

18-00:28:34

Rubens:

Oh, that has to do with money.

18-00:28:35

King:

Yes, that has to do with money. The plan was still fifty-fifty, I believe, at that time. The state budget was very tight back around 1990. Eventually, it ended up being two-thirds private funded, one-third state funded. There was a lot of fundraising remaining to be done, and the final design and construction remaining to be done, after I stopped being dean. Brad Moore took over as dean from me and oversaw a lot of that. What's interesting, of course, is that the two people who did the final, largest fundraising were Chang-Lin Tien and Y.T. Lee, working separately, not working that much together, but both working in the same part of the world. Tien, I believe, wanted to finish this project so as to have done something tangible for chemistry. Lee, of course, was a solid citizen of the college, even after he left Berkeley to become president of the Taiwanese Academia Sinica, which he did for many years. He still worked for this.

18-00:30:03

Rubens:

When did it actually go up?

18-00:30:06

King:

It's while I'm in Oakland that it went up, so it's got to be after '94, and I think relatively soon after '94. I think 1996. We need to check this, but I'm going to guess about '96. Just to finish off the building, the ultimate naming gift of it is interesting. We've actually used all of this in a scholarly way subsequently. The idea was to get a naming gift from the Asian countries, and there are all kinds of complications there, including Taiwan is not receptive to letting money go out of Taiwan. China, in those days, was not in a position to do this. Singapore is Singapore. A number of countries were being worked. It became apparent that the way to get a naming gift was not to be in the form of a single gift, but would be getting nine or ten or more different people to collaborate on a gift in a single name. That's what eventually happened. This, I had nothing to do with, but Tien and Lee did. It was a matter of getting people from Taiwan, Singapore, and Hong Kong to agree upon Tan Kah Kee as an honoree. He was a person who was a considerable humanitarian in that part of the world, back before, I think, and during World War Two. Deceased. They converged on that name, and that's the name that went eventually on the building. It was, at the time, the first Asian name on a Berkeley campus building.

18-00:32:05

Rubens:

That's a good story.

18-00:32:08

King:

Now, the way we've used it scholarly. As we will get to many interviews from now at the Center for Studies in Higher Education, one of our activities is an executive leadership academy, jointly with the American Association of Hispanics in Higher Education. We have put a theme of university leadership in a multicultural world or society as the theme of that. We take up various aspects of university leadership as they relate to things that arise as issues in a multicultural world. Tan Hall is a case study [in development] for that because of such interesting features as the fact that the Asian tradition is such that you do not ask people for written pledges. That's extremely demeaning and ugly thing to do. If you give your word, you give your word, and your word is valid. So how does one satisfy the U.S. need for written pledges, or the UC need for written pledges, in that world? There are elements like that that are rather interesting, having to do with the development operation for that building. Jane Scheiber is quite an expert on this. She was with it all the way through.

18-00:33:32

Rubens:

So by the time the naming fundraising is taking place, you're now a provost?

18-00:33:40

King:

Yes. I stopped being an active leader of the project when I became Provost of Professional Schools and Colleges in '87. At that point, I became chair of a building committee that was to balance all kinds of interests, the colleges being just one of the interests. So that changed my role. When it actually opened, I believe I was down in Oakland in the provost position there.

18-00:34:10

Rubens:

And clearly here at the ceremony.

18-00:34:12

King:

I did come back for the ceremony.

18-00:34:15

Rubens:

So this is the primary occupation while you're dean.

18-00:34:18

King:

That was the biggest thing, and space was probably the biggest single issue. The values of the chemists and the expectations of the chemists are that the dean could not delegate the management of space. Even the transfer of 100 square feet from one person to another, no. You couldn't do that. That's too important. The dean has to do that. All throughout my deanship, since the new building was not up, I was dealing with very tight space and trying to keep a reservoir of things here and there that I knew were coming available. It gave me some flexibility in this. But that was very challenging. Just the inadequacy of the entire space picture was a big challenge. Then, if I'm supposed to make these decisions, I'd better do it in an informed fashion. In those days, still being a do-it-yourself person, I tried to find ways to go look at space. You're going to cause all kinds of mayhem if you look at the space with people in the room. I remember once coming in at three o'clock on New Years Day afternoon to look at space. Of course, I should have known. It's chemistry. The research is everything. I go into a room, there's graduate students. Then the next work day after that, I have the professor in on me. "You were looking at my laboratory. Why were you looking at my laboratory?" I figured there has to be a better way of doing this. I was blessed by having an individual in the college, a longtime college employee, Ed Dutto, who was just the kindest, sweetest guy you would ever know and whom everybody had grown to count on to solve any issue that they needed solved with regard to the functioning of the rest of the campus or something having to do with the workability of space in the college.

18-00:36:19

Rubens:

What was his exact job?



18-00:36:21

King:

Head of college facilities would have been his title—something like that. He was all the time going around looking at all the rooms. We finally worked it out. I would tell Ed what I needed to know, Ed would go look at it and find it out, and Ed would tell me, and now I knew, and nobody knew I had been looking at the space. That finally worked very well. That was really a tense and difficult issue all the way through.

18-00:36:48

Rubens:

Were you doing some shifting?

18-00:36:50

King:

Continually I had to do that. The college had taken one very wise step before my deanship, and that was to make generic organic chemistry labs. There would be four stations, so-called, within a typical room. Then the graduate students would choose their research advisor. Any given person might have more or less in any given year, so we had to keep swinging space back and forth all the time and just did it on the basis of one station per coworker. That worked fairly well in organic chemistry. But for all the others, particularly physical chemistry, there's big equipment, very specialized equipment. It would be a big deal to move somebody from one room to another. It would be expensive and also shut their research down for a while, so it's not a small issue. So yes, we continually had to shift space or make space for new faculty. I remember one particularly difficult such operation, which was one of the first women faculty members in the college, who was Angelica Stacy, who has [since] done quite a bit on campus. She's in the chancellor's office. In fact, she's the acting associate provost for academic advancement, I guess it's called. Faculty advancement.

18-00:38:22

Rubens:

So she's a chemist.

18-00:38:24

King:

She's a chemist. She's an inorganic chemist. I had to create space for her within inorganic chemistry as a brand-new faculty member. This had all kinds of issues attached to it. A very distinguished, near Nobelist who had very few students but still had space. Angie, who needed space. Also, inorganic chemistry space is such that it doesn't have to be that specially built, so it can swing back and forth with other kinds of space. Organic chemistry space is not that way. An organic lab is an organic lab. That was why that was handled through the reassigning of stations. In this one, it's not so clear-cut. I had to do quite a bit getting space for her, I remember. I think we did get good space.

This would be true for any other new faculty member as well. One of the other early ones I got into was the attempt to hire a very distinguished organic chemist from the University of Wisconsin. That person had very large and very special space desires. We were competing with—I've forgotten whether it was Stanford or Caltech—and with Wisconsin, who wanted to retain this individual. As I walked into the position, the first thing was the need to get major facilities for this guy. That required getting money from the chancellor's office, so I went through everything that was involved in that. This person was offered the job, delayed his decision, and delayed his decision. We then learned that there was rapid building of laboratories at Wisconsin going on as he delayed his decision. He ended up staying at Wisconsin for another one or two years, whereupon he went to Stanford. That's the way things happen within the academy. But that was one of the more effective ways of getting space improvements in the college during this era before this new building. We did have major retention issues. A lot of what it took to retain people was laboratories, and so I was actually getting a significant amount, a very substantial amount, of laboratory renovation money out of the chancellor's office as retention money in these retention cases. The space was the hugest issue.

18-00:41:09

Rubens:

It's not your own development money that's going into—

18-00:41:13

King:

It wasn't big enough, our own development money.

18-00:41:17

Rubens:

It's primarily oriented to the building?

18-00:41:18

King:

Yes. There are two kinds of development. There's getting a big gift, like [from the] McCollum[s]. That's an unusual one-of-a-kind type of thing back in the early years of a development operation. You do have to go through the first five or six years of a development operation just building it and reaching a circle of friends and having events and doing things that bring people to campus and get them interested. You don't just get the money immediately, and a letter won't do it unless you have done these other things that warm people's hearts. So most of my period in the dean's office was building the development operation, with Jane and eventually others working on that.

18-00:42:05

Rubens:

Meeting with donors, donors that were identified?

18-00:42:09

King:

Yes, I would do that.

18-00:42:11

Rubens:

A certain amount of entertaining?

18-00:42:13

King:

We started, and still have, events for alumni of the college, which bring them back. We've had college open house for alumni type days. We have a variety of alumni groups, one of which is called the Free Radicals, which is alumni from the sixties. Then there are the Cupola Era graduates, who are from the days when the old chemistry building was still up. That's the one that got supplanted by Hildebrand Hall, but its cupola still sits out there on the plaza, atop Giauque Hall, which is a totally underground building. So the cupola is therefore the symbol of the Cupola Era. That's people who graduated up through the fifties. That's now a fairly elderly group. Then from other eras, there are other alumni groups. We've done those things.

18-00:43:17

Rubens:

There may be more to discuss about space, but let me just ask you, because you mentioned about faculty retention, I'm wondering if you have a sort of overall perspective of how many retirements occurred when you were dean. Is retirement a pretty significant phenomena at that point? Is the college expanding?

18-00:43:43

King:

The college is probably expanding a little, and of course that impacted the space situation because that meant you didn't have released space to put a new faculty member into. It's expanding a little at that time. Yes, there were retirements. There was also an issue that I had to take on for the first time, which was to create a policy, a college policy, having to do with the rights of emeriti to have space and to supervise coworkers. We did create such a policy, and that took a good bit of iteration and discussion and contention. We were probably the first, or one of the very first, units on campus to have such a policy. It's significant. We had retirements like Melvin Calvin coming. There's a Nobelist who had his own round building built for him on campus and wanted to remain active after retirement. Henry Rapoport, Bill Dauben in organic chemistry, were all in that situation. They don't want to just stop research, so what are you going to allow? We eventually came up with a policy that said that an emeritus still active in research can have up to—I think it was 600 square feet of space. Not much. May only take on a registered graduate student under joint supervision with another faculty member, who will be the prime supervisor, and may have post-docs or undergraduates up to the point that their space will accommodate. As other units had to start doing this, that became a little bit of a model, because I would point it out and give copies of it to various of my other units within the professional schools and colleges.

18-00:45:56

Rubens:

I'm sorry, it slipped out of my mind. Did endowed chairs come in during this period when you were dean?

18-00:46:06

King:

I believe the issue at that time, or the feeling at that time, was still pretty much this issue that having an endowed chair and having to appoint one person into it would, in ways, be counterproductive to the "everybody is expected to be the best" attitude of the college, and so it wasn't encouraged much. There was one endowed chair that had been given, I think, during Phillips time, by the Chevron Corporation, quite possibly associated with the hundredth birthday of Joel Hildebrand, the preparations for which occurred during Phillips's time, the doing of which occurred as one of the first events of my time. Chevron had given a Joel Hildebrand chair in chemistry, which was to be held one year at a time by an assistant professor.

18-00:47:02

Rubens:

Oh my goodness. That's a little unusual, isn't it?

18-00:47:05

King:

Quite unusual, particularly for the first endowed chair.

18-00:47:10

Rubens:

Had to be a senior person.

18-00:47:11

King:

Yes. But that also was a way of having an endowed chair and not having to name just one chemist to it.

18-00:47:21

Rubens:

Was that your idea?

18-00:47:23

King:

No, I'm not the one who arranged for that chair. Phillips had, I think. I believe it was one of the things associated with Joel Hildebrand's hundredth birthday, which was November 16, 1981. A big, big deal was made out of this.

18-00:47:40

Rubens:

Let's discuss that in just one second. No other endowed chairs came in while you were—

18-00:47:46

King:

I believe that is correct.

18-00:47:48

Rubens:

So, Hildebrand. Was he a Nobelist?

18-00:47:52

King:

Not a Nobel Laureate, but a very interesting figure. In fact, I've learned more about him as the years have gone on. A very revered and respected figure. Hildebrand was still there when I came here in '63. He was still doing research. Many, many things were distinctive about Hildebrand, but one of them was that he published more papers after he retired than before he retired. He really got going in research. He had also done a number of other things during his pre-retirement career. Among the things he did were very successful textbooks, and teaching of freshman chemistry continually. He had had, I believe, 40,000 students in freshman chemistry that he taught. He also had been quite a figure on the Berkeley campus scene heavily through the Academic Senate. He was, at one point, the dean of letters and science. Now, that's odd, because the college of chemistry isn't in the college of letters and science, but he did hold that for a while. He was also a person who had been very prominent in the so-called Wheeler Rebellion of 1930, when the Academic Senate established itself with the roles that it has, and had been active in things like the loyalty oath controversy, too. He had been a big figure around campus.

18-00:49:35

Rubens:

What was his specific research or niche?

18-00:49:42

King:

Liquids. The properties of liquids. One thing he studied quite a bit was miscibility. There's a very famous frontispiece to one of Hildebrand's books that shows a test tube with nine immiscible liquids in it, one of which is mercury. That's cheating a little bit. But indeed, nine things, all of which were immiscible with one another. So explanation of miscibility. He had created a concept called the solubility parameter that could, in part, explain immiscibility, but explain activity coefficients and their size. Now I need to say what an activity coefficient is, I suppose. It's a measure of the degree of non-ideality of a component in a liquid solution.

18-00:50:33

Rubens:

Ideality?

18-00:50:34

King:

Non-ideality, I have to explain. Shall we do Raoult's Law?

18-00:50:47

Rubens:

Let's hear it.

18-00:50:50

King:

Here's a liquid. It has a certain vapor pressure. You're getting my one-minute explanation. Here's a liquid in the pure state. It has a certain vapor pressure. Now let's put it in a solution. Fifty-fifty mole fraction with something else. If that is an ideal solution, the partial pressure

equilibrium pressure exerted over that liquid component will be half of its pure component vapor pressure. But if it's not an ideal solution, it will be something different, and most likely something more. That phenomenon is predicted and analyzed through what are called activity coefficients, and there are various correlations for predicting these and analyzing these, and Hildebrand had one of these, including the solubility parameter in the predictive method.

18-00:51:40

Rubens: Whose law did you mention?

18-00:51:42

King: Raoult. Famous French chemist.

18-00:51:45

Rubens: How does this bear on—

18-00:51:46

King: Raoult's Law describes ideal solutions. Raoult's Law says that if you've got 50 mole percent of something in a solution, then it should exert an equilibrium partial pressure 50 percent of the vapor pressure.

18-00:52:02

Rubens: Okay, that's the law. What is an ideal solution?

18-00:52:08

King: That's one that adheres to Raoult's Law. But most are non-ideal and don't adhere, so Raoult's Law, in that sense, isn't much of a law.

18-00:52:22

Rubens: So Hildebrand's hundredth birthday.

18-00:52:26

King: Huge event. It was the first event that had been held out in the college of chemistry plaza, and what we did was fill the whole plaza with folding chairs. A big stage up there. All kinds of figures there, reflecting on Hildebrand's hundredth birthday. Who was the president of the time? Whoever it was, he was there—of the university. 1981, so that's pre-Gardner. That's going to be Saxon. So Saxon was there. Bowker.

18-00:53:01

Rubens: Are you organizing this event?

18-00:53:02

King: I have had it organized for me. It was just absolutely wonderful. The dean was to be the master of ceremonies for the whole thing, and here it was. I had a book this thick telling me what was going to happen and what was the script. It was marvelous. It never happened again. I always have had to organize whatever it is. This had been beautifully

organized for me. Joel was in fine fettle. We had a letter from the president of the U.S., and we had a letter from this distinguished person and that distinguished person, all of which got read. It was a huge, glorious event, then followed by a luncheon down in the Pauley ballroom.

18-00:53:44

Rubens: Big one.

18-00:53:45

King: Oh, yes, huge. That actually became very useful to us, because we started holding the commencements of the college of chemistry out there, and did so all through my time and for many years, until just about five or six years ago, when they started going indoors instead. So yes, I held many commencements out there. Gave Glenn Seaborg his Berkeley citation out there, et cetera.

18-00:54:18

Rubens: Any other stories like that we should include? How well did you know Seaborg?

18-00:54:24

King: I knew Seaborg quite well. We talked about one event early on in my career here, when Jeanne and I were challenged with finding what the Seaborgs would talk about in conversation. The answer was Cal sports. I came to know Glenn quite well. In fact, jumping ahead, when Glenn was chair of the Lawrence Hall of Science, which he was for many years, they were unhappy with the administrative attention they were getting, and so Glenn actually requested a transfer of the Lawrence Hall to the provost of professional schools and colleges, and so I had the Lawrence Hall under me for several years with Glenn there. It was his huge, abiding interest in his later life. Much interaction with him on that. I enjoyed Glenn. He was an interesting individual. You should read sometime his book on his chancellorship at Berkeley.

18-00:55:30

Rubens: I've looked at it, but I haven't read it.

18-00:55:32

King: You're not going to find yourself attracted to read it, and that's the issue. Glenn Seaborg kept a diary every day of his professional life. That book is just the diary.

18-00:55:45

Rubens: UC Press was reluctant to publish it.

18-00:55:47

King: UC Press did not publish it. It's published by the Public Policy Press of IGS here on campus.

18-00:55:55

Rubens:

That's right, they wouldn't publish it because they felt it was indigestible.

18-00:56:00

King:

So Glenn did that, and I can remember an event—I've forgotten what it was—it may have been a Lewis Lecture, which we would give every year. Bring in a big speaker for the Lewis Lecture and hold it in Wheeler Auditorium. I think before one of those, and it may have been Glenn's own Lewis Lecture, he popped up a photo of some twenty people standing on the steps of something or other, and stood there for about six minutes, trying to identify each one of them. Just working from memory. Which was kind of interesting, but that was Glenn. He would do things like that, in his own way. If you read the chancellor book, he was a very effective chancellor, and he obviously was a very good head of the Atomic Energy Commission through three presidents, I think it was. I had not known him in my earlier career because of that. He had been in Washington many, many, many years as head of the Atomic Energy Commission, then came back.

#### Audio File 19

19-00:00:00

Rubens:

During your dean years, '81 to '87. I'd love it if you'd talk a little bit about how you're brought into central administration through the dean's council. We've talked about how you met with Park and Heyman regarding funding, and also with central planning. What is the dean's council?

19-00:00:38

King:

I think there's a different answer today than in those days. First of all, in those days, the meeting of deans would be with Doris Calloway. It would be with the provost of professional schools and colleges, and it would be the thirteen professional schools and colleges deans meeting with the provost. Those I continued very much through my time as provost, and they're just basically a matter of being able to put major central issues before the deans and hear the views of the collected deans on whatever topic may be of concern to them or may be of concern to the central administration. A vehicle to talk for two hours in the most meaningful way you can.

19-00:01:35

Rubens:

But with the provost?

19-00:01:38

King:

Yes.

19-00:01:38

Rubens:

Not the chancellor?



19-00:01:39

King:

That's correct, although it now is with the chancellor. In those days, it was the provost. There may also have been the use of the term "council of deans" for certain ad-hoc meetings of deans with the chancellor on some issues, but they were not the regularly occurring things.

19-00:02:00

Rubens:

How often did they occur?

19-00:02:02

King:

I think with the chancellor, they occurred on an as-needed basis. With the provost for professional schools and colleges, once per semester, twice per year. Some of the large issues were some that we've already talked about. One was this business of differential salaries for engineering and business. Another was the development of fundraising at the central campus level and all the issues of interfacing and conflict of that with the unit fundraising activities. That's the sort of issue. Sometimes it would be different issues, or academic issues, but those were the two big ones that I recall.

19-00:02:52

Rubens:

We talked some about meeting with the engineering deans. There's a whole list on them. Maybe we'll pick up the list and talk about specific deans when you become provost and they're under you.

19-00:03:08

King:

When I'm provost and have thirteen deans reporting to me, yes. That's a different situation.

19-00:03:17

Rubens:

When you were on the council, are there any other outstanding memories or scenes? There's the issue of the differential pay.

19-00:03:33

King:

The first one of these deans meetings that I appeared at actually was not a regular deans meeting. It was a meeting of the deans without the provost or anybody from the administration. It was very early on after I became dean, and it was an effort from business and engineering to move the special salary issue. That one, I was in a very awkward position on, because here I am an engineer and I've got the split college phenomenon that I'm now administering. I suppose even though it had started July 1 of the year I became dean, it still had some residual issues, and that's what the meeting was about. That wasn't exactly a meeting with the administration. It was a meeting to get ready for the administration. I don't know what more there is to say about the meetings with the administration. They happened. I had the feeling that they had two purposes. One was to make sure that the deans had an opportunity to say anything they wanted to say to the

administration, and the second was so that the administration could take up any topic they wanted with the deans. Now, there is an important difference here, which maybe we should spend some time on, and that is that the provost for professional schools and colleges, of course, had regularly scheduled meetings with each of the thirteen deans. Individually.

What's different about a meeting with all thirteen of them together? Well, what's different is that now that anything said by either party is going to be heard by everyone. So it's a different kind of meeting. The issues of a college or of a school were really addressed and solved and worked on during the individual meetings with these people. It was the collective campus issues, where either the administration felt there was a need for the deans to hear or think more about subject X, or where the deans had something on their mind that they wanted the administration to hear about. I now remember another subject in that latter category, which was, were the professions being treated properly by the budget committee in faculty advancement processes? Of course, that's one that I inherited full force when I became provost. It was a subject of rumbling and complaint, particularly from those professional schools and colleges that felt they should have been getting more out of the advancement process. Not unrelated to the salary issue, by the way.

19-00:06:40

Rubens:

It seems that it would be. How often, then, as dean, would you meet with the provost?

19-00:06:48

King:

I probably met with her at least monthly, and sometimes more often.

19-00:06:55

Rubens:

So these were regularly scheduled meetings, independent of you—

19-00:06:58

King:

Standing meetings, so-called. It just gets scheduled without the topics being known when it's scheduled. We'll schedule you meetings for this entire academic year. Here they are, ten of them. That kind of thing.

19-00:07:12

Rubens:

I didn't ask, where did you sit as dean? Literally, where was your office?

19-00:07:16

King:

Fourth floor of Latimer Hall. It had been the dean's office, and still is. It's right as you get off the elevators on the fourth floor of Latimer Hall. It's a floor of Latimer that was built differently from the other floors initially. The other floors, of course, had to have their nitrogen

and their water and their fuel gas and whatnot, and high-amperage electricity piped around. Fourth floor didn't. That was for this reason. Leads to another interesting story, which has to do with state policy on state-funded buildings with regard to what can be air-conditioned and what isn't air-conditioned. If your campus was within a certain number of miles of the coast, you can't do air conditioning for people purposes, but you can do it for sensitive instruments. Part of the criteria for the layout of a chemistry building is to get an adequate distribution, widespread enough, of sensitive instruments to make it cheaper to air condition the whole building.

19-00:08:24

Rubens:

I also didn't ask of your chairmanship, but I'm now asking you specifically of being a dean, did you have annual reports that you had to write in these positions?

19-00:08:37

King:

Yes and no. I didn't write an annual report of the sort that you would think of as one. I would have, if I had been there after the fundraising had gotten more mature, because that's a useful document for fundraising. There's something that pretty much amounted to an annual report, which is there had to be the annual request for faculty recruitment permits. I would orchestrate that for the college. I would get documents from both the chairs, indicating what they wanted. They would paint a picture of their situation and all the things that influenced their desires and why they were good desires. Then I would do the same thing for the college, a narrative picture, and then prioritize among these recruitment requests. That would all go forward to not just the provost, because the provost was going to refer them immediately to the budget committee. This goes to the budget committee, too, because they advise on the allocation of faculty positions. That was an annual occasion to put together one's thoughts about the college. It functioned very much as such, except it wasn't pretty and suitable for handing out for development purposes.

19-00:09:59

Rubens:

You're submitting some of that information to your deans when you were chair?

19-00:10:03

King:

Yes, although that process got formalized rather late in my chairmanship and really hit full formality during my time as dean, and has continued to be enforced.

19-00:10:22

Rubens:

Now, something you mentioned is that you're working with a staff. The staff appreciation day was important. That had already been set up as an annual—

19-00:10:33

King:

Yes. I certainly continued it and tried to make it a big event, and did what I could to encourage faculty participation and attendance at it. We would give out service awards. The College of Chemistry is unique that way. It had a lot of long-term employees. I would hand out twenty-year service pins, thirty-year service pins, forty-year service pins. My forty-year service pin was for Tashinian who had been head of the micro analytical laboratory, and had been a Manhattan Project employee.

19-00:11:17

Rubens:

What ladder was that? That's an employee, though, not a faculty person?

19-00:11:22

King:

That's a staff person. Part of these excellent facilities and excellent shops was also excellent people to run these things and do these things. We had a head of the nuclear magnetic resonance facility, who probably would have stood very favorably among such people in the whole world with regard to expertise and capabilities on these things. The micro analytical laboratory, with the micro underlined, was a unique thing, relating very much to the Manhattan Project[, for analysis] in trace quantities. That was a very professional and polished outfit and individual running it. The head of the shops, the machinists within the shops, were uniquely talented people. The mass spectrometry lab was the same way, and so forth, through them all. In fact, one of the bigger recruitments during my time as dean was a new head of the electronics shop. That's right there with the faculty positions with regard to importance and the degree of attention you pay to it.

19-00:12:35

Rubens:

And their salaries were pretty good?

19-00:12:37

King:

Yes, the salaries were certainly competitive enough to keep them. Plus, people just plain liked working there, so they were happy to work there for a career. The college had very, very dedicated employees. That's one reason the staff appreciation function was important.

19-00:13:00

Rubens:

I asked how many staff people you had when you were chair, and we talked about that.

19-00:13:05

King:

That's very few.

19-00:13:06

Rubens:

Yeah, and that was about a third compared to—

19-00:13:08

King:

It would be the clerical staff.

19-00:13:11

Rubens:

Right. With the college of chemistry, how many are we—

19-00:13:15

King:

About 200 people. That was the shops people, services people of various kinds. Clericals are included in that number. The college had an interesting history with regard to how to keep it all humming with all these staff and keep things done right. The person who I actually inherited, but worked very closely with during my time as dean, was Gary Matteson. Don't confuse him with Gary Matkin who was in university extension. Gary Matteson, who had originally come from Davis, and actually lived in Davis weekends, and lived on a boat during the week down here in the Bay Area. He was the one who organized all of this and was the chief administrator of the staff, which was a very difficult position. A lot bearing on it and a lot that could come at it from faculty members who had some absolutely unique thing they wanted done immediately. They always wanted [it] immediately. Could it be gotten to happen? Either Gary would work on this or he would pass it on to Ed Dutto, who I mentioned earlier, the space and facilities person. I think that a lot of the secret of the college of chemistry is these people—their contentment and interest in working in the college, being able to retain very capable people for very long times, and them being a very critical part of teams. That didn't happen within L&S. One of the things that happened during my tenure as dean was a lot of knocks on my door from people in L&S, say the chair of the physics department or the chair of biology or whatever. "How do you folks do it in chemistry? How are you funding them? How do you get all of this to happen and to work?" There was great interest in creating that in other places. The college clearly had something that was generally superior to anything else on campus, and which had come as a result of it being a college of chemistry. That probably is the number one way in which the organization and identity as a separate college of chemistry has been important.

So how did we fund all of these things and keep them done? There was state budget in those days, but you also recovered recharge monies from research grants. There's been a progression through the history of the college. I remember when Harold Johnston was dean, was the first time where we recharged to grants at all. Service had just been provided before that. Then there became a recharge of 10 percent of the cost, then 20, then 30 and 40. I think 20 and 30 and 40 were during my day. Eventually it got to where that percentage was higher and higher, and then it got to where the entire cost had to be recharged to projects. So we've left what existed at the beginning of all of that, was a world where you could do very good research without a government

grant, if you somehow had your coworker or didn't need one, to a world where you had to have substantial government grants in order to get the services.

19-00:17:10

Rubens:

The double segue here is that there was quite a bit of pressure coming from the federal government, but certainly Heyman's administration, about affirmative action and minority hiring. We joked a little that you represented, as dean, a minority because you're chem-e. Let's review the first women who came on to chem-e and to chemistry.

19-00:17:39

King:

In chemical engineering, the first women are in fact after my time. My own PhD graduate, Keith Alexandere, who is AfricanAmerican, was hired to head the Product Development Program in ChE, in 2006. We do have a Cuban faculty member who came from Exxon Research and Engineering, where he'd had a career. All of these are well since my time. In chemistry, the first women would have been Judith Klinman, Darleane Hoffman, and Angie Stacy, who both came in in 1984. Stacy came as an assistant professor. She was the first entry-level woman hire into chemistry. Hoffman was quite different, because she had had a distinguished career before she came with the chemistry department. She had been an employee of Los Alamos, and a very well-recognized chemist there, including having done the original isolation of plutonium from nature. Seaborg's original plutonium was man-made, made in reactors. Hers, she found it in nature. It was a big deal to find that. So she came at a senior point in her career, and also came as much to the Lawrence Berkeley Lab as to the Berkeley campus, so in that way it was different. Stacy was the first one we had to move through, starting as a brand-new assistant professor and getting all the things you need to get as your career develops.

19-00:19:24

Rubens:

Who was the other woman you mentioned?

19-00:19:26

King:

Judith Klinman. She's been chair of chemistry also. She's in the biophysical chemistry area. She was there at the beginning of my deanship. The first minority in chemistry was an Asian, Sung-Hou Kim, who also was already onboard when I became dean. There's been an interesting history concerning women in chemistry, and I'm now speaking nationally. I think I can probably add chemical engineering to this, too, but the story is a little different. With regard to women in chemistry nationally, if you look at all fields together, it has been a slow one to bring women in. Certainly when you consider the percentage of women among, originally, the undergraduate students, then the graduate students, that was a way higher percentage than the women that had been on faculty, and I believe that's still the case,

although the numbers do increase. I think it relates in part to this feeling in the upper parts of the chemistry world that quality outranks everything and that you must, in hiring faculty, get the very highest quality person you can, and that the way to find high-quality people, traditionally, is to go to your friends at Harvard and Yale and Stanford and whatever, and find out who are their very capable people, and do it through that kind of recommendation rather than a full search and recruitment. Chemistry has undergone the transition, as has chemical engineering, from doing things that way to doing full searches. In fact, chemical engineering started it much earlier on. In chemistry, it was still a matter of, if there's a bright star out there who might be interested in coming to Berkeley, let's drop everything and try to get that bright star to Berkeley. That while the formal searches were going on. One way or another, women coming into faculty positions, and particularly making it strongly in faculty positions, has been a lesser percentage than the pool, if you consider the pool to be those with doctorate's degrees. So there has been a need to encourage this process as much as possible.

I'm going to look back on myself for a moment, and then I want to get to chemical engineering, where this story is a little different. Looking back on myself, yes, I was subject to the quality driving force during my time as chair. I, in hindsight, gave nowhere near as much attention as I should have to trying to diversify the chemical engineering faculty. I think it was during my tenure as dean of chemistry that the light really dawned on this. That this is something that was an objective, both women and minorities, had to be given attention, had to be given the care of administrators who would have a lot to do with whether it happened and how well it happened, and to get it done right. That had moved very high on my list by the time I got towards the end of my time as dean, so it was during that time.

Now let's talk about chemical engineers. Thinking back on my time at MIT as a graduate student, I cannot think of a woman graduate student in that department. None. Zero. I came to Berkeley. We would have, say, fifty in the undergraduate chemical engineering class going through. One or two [women] at most. Then, very interestingly, and this is a phenomenon I registered on well at the time, in the early part of the 1970s, more women started to appear in chemical engineering, and we went, over the course of not very many years, two or three or four years, from the one or two situation to 10 or 15 percent. I now think that was just simply reinforcement in numbers, and not being the only one in the classroom, but having some others there with you, was a very important part of that. The rise of women in chemical engineering going into graduate school was slower than in chemistry. It was not until the very late seventies and the eighties that women started coming in substantial number to graduate school. The way I

pegged that in my own mind is Gail Greenwald, who was my own graduate student, who I mentioned before, who became a vice president of Arthur D. Little in Cambridge, Massachusetts. She was an early one. Her degree with me is 1980. That's still later than the growth in chemistry.

Now, engineering has had this problem throughout areas of engineering; it isn't a very diverse student body or faculty body as a result. Where we are today is striking. There's a great gradation among types of engineering as to the presence of women. Bioengineering, or biochemical engineering, has, of order, 50 percent women. Chemical engineering now has, of order, 30 percent women, and something like electrical engineering and computer science is still down at pretty low numbers. It has worked out so that there are certain types of engineering that women are drawn to and/or are more comfortable with and/or persevere with better.

19-00:26:13

Rubens:

Wasn't there something called the MESA Project in engineering?

19-00:26:15

King:

Yes. The "M" is "minority" on that. Engineering Science Achievement. No, it's Mathematics, Engineering, and Science Achievement. That's what it is. Yes, that, in fact, grew out of Berkeley, in petroleum engineering, and is now national and all engineering disciplines and quite successful. That was an effort to bring minorities into engineering by nurturing their careers as they went along. We need much more of that. We will get to my current interest in trying to soften engineering education, and in that way help with the diversification of engineering. It's a huge need.

19-00:27:05

Rubens:

Is there anything we should say about your relationship to the Academic Senate? I didn't ask that, about when you were chair or then as dean. You're still a member of the Academic Senate?

19-00:27:18

King:

Yes, of course I'm a member of the Academic Senate as a faculty member. I got into administration early enough so that, if you can believe this, I was never on a committee of the Academic Senate until four months ago. I am currently on one that I got asked to be on.

19-00:27:42

Rubens:

What committee are you on?

19-00:27:43

King:

I am on what I call the Charlie Schwartz committee, which is the committee that they formed on university governance and structure.



It's a Berkeley campus committee, senate committee, looking at structure and governance at the system level.

19-00:28:02

Rubens: I read his newsletter, Charlie Schwartz.

19-00:28:07

King: It was Charlie who was the one who introduced the resolution that led to this motion in the Berkeley division of the Academic Senate. Any administrator had better read Charlie's writings.

19-00:28:19

Rubens: I forget what department he was with.

19-00:28:22

King: Physics.

19-00:28:24

Rubens: So because of your administrative duties, you were—

19-00:28:28

King: Charlie Schwartz's newsletters would appear all the time.

19-00:28:31

Rubens: But you were not on any Academic Senate committees because of your—

19-00:28:34

King: No, I was not. My dealings with the Academic Senate are indeed all [administrative] dealings with the Academic Senate up until four years ago, and a huge amount of that. The huge amount of dealing with the Academic Senate occurred really in the various provost positions, not chair or dean.

19-00:28:56

Rubens: All right, so we'll get to that. I had a note here to talk about when you and Y.T. Lee received the Nobel Prize in 1986.

19-00:29:08

King: Yes, that was a marvelous day.

19-00:29:11

Rubens: How were you notified?

19-00:29:15

King: I think I was notified by waking up to KCBS and finding out who the winners of the chemistry prize were. Then I came in and I discovered that Y.T. Lee is not here. He's in Los Alamos on some kind of scientific function or business. Of course, the press don't want to wait at all, so we had calls from TV stations, newspaper, and whatnot, wanting to come over here and talk with Y.T. Lee. We couldn't do

that. Y.T. Lee didn't get back until about three o'clock in the afternoon, when he flew back from Los Alamos. He got here then. I got to be the one to convey the press and the TV cameras through Y.T. Lee's labs, not knowing much about Y.T. Lee's research, but of course being able to get Y.T. Lee's students to explain Y.T. Lee's research. You'd been hearing about this all day and it was finally established that he would set foot on campus at something like 3:30 or four o'clock, so we decided we would have this huge event in the chemistry library. How we chose that, I don't know, but we cleared the chemistry library on the ground floor of Hildebrand Hall and set up a podium, and all kinds of people inside of it. I did some arranging, or had people do arranging, to get various things to happen. One of them was the champagne, but another one was the Cal band. So here comes the entire Cal band into this little chemistry library, playing away at the top of its decibels. You have never heard anything so loud in your life. It was really quite a remarkable event, and a huge amount of just genuine, positive, giant enthusiasm. Lee was very well-liked.

19-00:31:16

Rubens:

Was he liked?

19-00:31:17

King:

Oh, very much so.

19-00:31:19

Rubens:

It had been a while since there had been a Nobel winner. There were many distinguished Nobel winners earlier, but—

19-00:31:28

King:

It had been a while since there was one in chemistry. There had been, of course, in other disciplines, including a Polish poet that set off parking spaces for Nobelists. That was [Czeslaw] Milosz.

19-00:31:45

Rubens:

I was going to ask if Y.T. Lee got a parking place.

19-00:31:49

King:

Of course.

19-00:31:50

Rubens:

Had that already been established?

19-00:31:51

King:

Well, what is the order of events? Yes, Milosz was ahead of him, in 1980, so yes, he got one. When it was done for Milosz, it was done as something that would be done for all Nobelists. So Y.T. Lee got a parking space.

19-00:32:06

Rubens: I don't know if you want to comment at all, but Y.T. Lee has a very unusual trajectory. He'll renounce his citizenship.

19-00:32:21

King: I don't think he renounced his citizenship.

19-00:32:23

Rubens: He did. He became—

19-00:32:25

King: Did he? Well, he certainly moved.

19-00:32:26

Rubens: To Taiwan.

19-00:32:28

King: But is he no longer a U.S. citizen?

19-00:32:29

Rubens: Yes, I'm pretty sure.

19-00:30:30

King: Oh, really? I don't know that. Because they have maintained their home in Orinda.

19-00:32:34

Rubens: Is that right?

19-00:32:35

King: I think it is. In any event, yes, after the Nobel Prize, a couple of things happened to him. One was that he needed better research laboratory space, and so we renovated Giauque Hall.

19-00:32:56

Rubens: What is that name you're saying?

19-00:32:58

King: William F. Giauque is one of the chemistry Nobelists of Berkeley. He was the ultra-low temperature man, the one who studied temperatures down very close to absolute zero. Therefore, he was the reason why we have a hydrogen plant, which has come up earlier, and a helium plant, which is a way of getting down to still lower temperatures, liquefying helium. Giauque Hall was a very, very specialized building. Totally underground. Built with a rush ventilation system that could sweep a leakage of hydrogen out onto what is now the plaza on moment's notice. Built with very strange rooms. There was something called the Battery Room, which, as I recall, was five feet high. That had something to do with the shape and number of batteries needed for Giauque's magnets. He built these huge magnets, electromagnets, to reach low temperature. So what do you do with a five foot high room?

How do you reuse that? Giaque had now gone totally out of the research business. We had his mechanic and engineer on the college staff. We still ran the hydrogen plant, because there was a market for that, and the helium plant. But we needed space for Y.T. Lee, and here was this building. So we went through a very interesting and large project of redesigning Giaque Hall and refitting it for Y.T. Lee.

He then, as you brought up, left for Taiwan not so long after that, and had a remarkably distinguished career there, where he has been president of the Academia Sinica, which is like their National Academy of Sciences, for years. Very respected. I even recall a point in time back there when they were first getting serious elections between the two parties in Taiwan—the Kuomintang was no longer necessarily dominant—rumor had it that Y.T. Lee had been asked to run for vice president by both candidates, both parties, but had refused both, believing he did not want to go into the high level of the political and governmental world. He has retained his Berkeley affiliation. He has had students at Berkeley, and I believe they've maintained their home here. I believe he's also spending a greater percentage of his time here now, since he is no longer the president of the Academia Sinica.

19-00:35:53

Rubens:

I'll double-check that, but I remember being a little shocked—

19-00:35:56

King:

He is very respected within chemistry. The quality of his research held enormous cachet.

19-00:36:01

Rubens:

It was dynamics of elementary chemical processes?

19-00:36:08

King:

And particles, yes. I remember a time—maybe it was only once during my deanship—the time came when I had to find a new chair of the chemistry department, and so I went and talked to all of the chemistry faculty about who should be chair. The very common reaction I would get was, well, Y.T. Lee would be one of the best, but of course you can't do that to his research.

19-00:36:45

Rubens:

The last chemistry Nobel, I think, was Calvin '61.

19-00:36:51

King:

That's probably correct. That was rather shortly before I got here.

19-00:37:13

Rubens:

Let me look at my notes for a minute. I just wondered if you wanted to reflect at all on Mike Heyman.

19-00:37:23

King: Sure, and Rod Park maybe.

19-00:37:26

Rubens: Heyman will be there another three years while you're provost, so I don't know if you want to pick him up now.

19-00:37:34

King: Maybe that's the better time to pick him up. Let's do that. Also, on Park: because of the way the administration worked in those days, there were only two members of the administration that I dealt with continually as dean. They were the provost, Doris Calloway, and the vice chancellor for research, which was a newly created position. The occupant of that at the time, and the first occupant, was George Maslach. There was a time when Maslach, as part of the research portfolio, somehow had building projects. Some of my earlier arguing for what became called Tan Hall was to Maslach rather than to the others. I did have interactions with him on that.

19-00:38:23

Rubens: Anything that we should say particularly about that? Is it Heyman who creates that position?

19-00:38:34

King: Let me contrast him with Calloway. Calloway was always the caring person. Very interested in what you were doing and what the needs were and how you and she might work synergistically. It's not that George was not that. It was a more formal relationship, and possibly colored to some degree by the chemical engineering/chemistry phenomenon, because George went back long enough so that he had been involved in that fight as it happened. He had some of that in his own background. I don't think George treated us wrongly or improperly in any way. It was just sort of a formal relationship.

19-00:39:21

Rubens: Let me just get this clear. He had been the first provost of the professional college.

19-00:39:27

King: He was, and he—

19-00:39:29

Rubens: Then he goes to research—

19-00:39:30

King: Then he becomes vice chancellor for research. He's dean of engineering, then provost of PS&C [professional schools and colleges], then vice chancellor for research.

19-00:39:41

Rubens: We'll take it up next time. I have never been able to keep straight where the name "provost" comes from. What's the difference between provost—

19-00:39:50

King: It's medieval.

19-00:39:52

Rubens: How is it distinguished from vice chancellor?

19-00:39:57

King: It's military, it's martial, the term "provost." Provost Marshall. Do you know that term? I have a cute something in my office that I'll bring over to you. I can take it off its hook on the wall and you will see. I'm pretty sure it's a military title. The other is that it could be religious. Some of these terms have their origins back there, but I believe this one is a military origin.

19-00:40:41

Rubens: I do have your list of students here. You had mentioned Gail Greenwald. 1980 is when she gets her Ph.D.

19-00:40:47

King: Okay, so I got that right. Keith Alexander is one or two years after.

19-00:40:54

Rubens: '83.

19-00:41:07

King: Keith Alexander is the subject of a bet that I lost. I had been on sabbatical leave at Salt Lake City, and we discussed that sabbatical, and I think we also discussed my going up to Vancouver and getting an award from the ASEE, with the formal entertainment, all of this coming off of food poisoning. So sitting at the head table in agony that evening, I have next to me—maybe it's another event. Let me continue anyhow. I have next to me Charlie Sleicher of the University of Washington, who's talking to me about Berkeley. He says, "You folks have this policy that you'll never take one of your own undergraduates into graduate school." I said, "That's right." He said, "I'll bet you that you've just taken one of your undergraduates into graduate school." I said, "Oh, we haven't. I'll take that bet." It turns out it's Keith Alexander that we've taken into graduate school, an African American chemical engineer. We made an exception to our policy for him, since he was interested and came from Richmond and all of that. He was a magnificent graduate student. Charlie then won a bottle of wine off of me. It was what he asked for. This will display my naivety and his sophistication, because he makes his own wine.

19-00:42:51

Rubens:

Who are we talking about now?

19-00:42:52

King:

Charlie Sleicher the one that bet was with. [He made] A Washington, Columbia Valley wine, so he's obviously a huge, huge connoisseur. Here's this guy [me] who, at this time, was not [much of] a wine drinker, knew very little about wine, and the bet is a bottle of wine. I am to deliver him a bottle of wine. I take something that we have had recently that I thought would be okay to send to him, and I send it up to him. It's a bottle of white zinfandel, which of course is the pits of the pits at the time. It turns out he had this horribly negative reaction and thought I was doing him in for having made this bet where he knew the answer and I didn't. So I lost a bottle of wine, not very good wine, over Keith Alexander, and then he [Keith] became one of my very best graduate students. A high corporate executive, and now back at Berkeley, having created this product development program that we have.

19-00:43:57

Rubens:

I don't know that we ever said that the policy was not to hire undergraduates.

19-00:44:05

King:

It's not to take your own undergraduates into graduate school, or at least not without a diversifying experience, like three years of employment or a master's somewhere else.

19-00:44:17

Rubens:

And that's for chem-e or chemistry?

19-00:44:19

King:

It was both at that time. It was probably one that chem-e had inherited from chemistry, or taken on from chemistry.

19-00:44:28

Redman:

That's not an uncommon policy.

19-00:44:31

King:

The idea is that they need variety of experiences. Actually, I think, as a guiding principle, it's a good one. There are obviously times, reasons, and places where you should not adhere to it, but it's how new ideas and different ideas come into the intellectual process.

19-00:44:55

Rubens:

That was true in the history department as well, now that I think about it.

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Audio File 20

20-00:00:00

Rubens: I want to ask you two sort of seemingly random questions on disparate points. Mike Heyman took a strong position on the university divesting its investments from companies that had to do with South Africa. I'm wondering if that bore on you at all as dean. Were there companies that chemistry or chem-e had been associated with that were particularly targeted by students or by the administration?

20-00:01:14

King: Yes, that's an interesting question. You're correct. When the divestment issue came up, Mike took a strong stance on it. However, that didn't equate to the entire university's stance. There was a whole set of discussions on that with regents and the president and so forth. Anyhow, yes, Mike did take a strong stance, and we had companies who were friends of the college of chemistry, and, I believe, some were among the ones labeled as having investments in South Africa. The interesting answer to your question is that I don't think it influenced things at all. The reason is that we were probably dealing with different parts of the company. Like universities, companies are very large, broad structures, and they can be stove-piped, too. Those who would care about the divestment issue in a company would probably be the CEO and the marketing people—those who care about sales, those who care about balancing the bottom line. Our contacts were almost invariably the research and development people, which is another arm of the company. They are looking not at the university and its political positions, but they are looking at the university as a source of both ideas and talent to employ. That's independent of the divestment issue. I noticed no fallout from that is the answer.

20-00:02:45

Rubens: I just thought we ought to mention it. And I've never asked anybody this question: was it a substantial increase in pay to go from chair of a department to dean of a college?

20-00:03:02

King: Yes and no. That's probably worth some comment, too. The salary structure here is that department chairs get what is called a stipend, on top of their regular professorial pay. That stipend is not large. It may be a couple hundred dollars a month back in those days. They essentially get their professorial pay. By the time you move from department chair to a dean, the dean is on a unit separate pay structure. The way that was done was actually dean salaries went to a committee of chancellors and other system-wide people at the Office of the President. That policy has since changed. I served on that for years



later on. That committee is concerned with holding equity among the campuses and equity among the types of deans and so forth. The dean was a separate salary and was determined by the campus making a request to the system review body, and the system review body through the president making an answer. Yes, the dean's salaries are higher. They're, again, not that much higher. In the case of somebody who is a scientist or engineer, and therefore has summer salary, there is the interesting question of what you do with regard to the summer salary situation, which you would have as a professor through research. There was also a question in those days of what percent time dean are you. I actually started off as a 50 percent dean on a ten-month appointment. Now, there are nine-month appointments, there are eleven-month appointments, and those are the two that people know about. The nine is for the academic year and leaves open the summer for other possibilities. The eleven is essentially a fulltime appointment. This was a ten, which was halfway in between. It was selected to let me continue taking summer salary from research to some extent, which I had the capability of doing, and that would help the overall salary situation. The deanship of the college of chemistry in those days was considered a 50 percent job, so the other half of my appointment was my regular professorial appointment. That changed a few years after I got into the deanship and became 100 percent appointment. Doris Calloway just simply did that one day, and said she believed this needed to be 100 percent appointment. I had no knowledge of what she was comparing to, nor had I gone around in any way, sniffing to see what other types of deans had in the way of percentage time. She just made that determination, I suppose with Mike and Rod Park. So I became a fulltime dean. What I did bore no resemblance to what the percent time appointment was. I did the dean's job, 50 or 100 percent.

20-00:06:16

Rubens:

You talked about one of the first issues you had to wrangle with when you were dean was the differential pay. I don't know if you were aware of it, but looking back, was there differential pay among deans? The dean of the law school, for instance.

20-00:06:33

King:

I know a lot about that. I came to know a lot about that when I became provost with thirteen deans reporting to me. There is a difference among deans, and it relates somewhat to the market, and it relates somewhat to the size of the college or school; the bigger the college or school, the larger the decanal salary. There are some fields where the market is such that the salaries just have to be higher. Examples of that would be business, law, and engineering.

20-00:07:11

Rubens:

To your knowledge or remembrance, this was not a particular issue, or was this a particular issue, during your years? Almost seven years as

being dean. Were there people complaining about the differential salaries?

20-00:07:26

King:

No, I was not aware of any complaining, even in meetings of deans by themselves or in one-to-one or one-to-two conversations. That issue just simply wasn't there. The issue, as I believe I've mentioned before, was heavily the question of development and the ability of the colleges and schools to retain their own independence in the development operations. There I was sort of a new kid on the block because of the fact that the college of chemistry was just starting up [in development].

20-00:08:02

Rubens:

Right, its development. You talked about Jane Scheiber. There are two other questions that I think we should pursue, and then maybe we've done the deanship. We said earlier that we're going to talk about your relationship to Mike Heyman and Rod Park when you become provost. We can dip back and compare. Last week, you said the primary people that you had contact with were Doris Calloway and George Maslach.

20-00:08:41

King:

The contact was much more with Doris Calloway. We can get into this more as a subject in the discussion of the provost position, but that was an interesting thing, and I think a valuable thing, about the structure whereby there was a provost for professional schools and colleges. That provost spent a lot of time with the individual deans in a way that's just not possible the way things are structured today. Doris would engage problems with me. I would discuss them with her. It was not, by any means, solely a matter of my coming, wanting this amount of money at this meeting, and that amount of money at that meeting, although chemistry did gobble up provost discretionary funds for recruitments because they were expensive. There were lots of other issues on how to deal with matters—how to approach the issues of faculty diversity, for example; how to deal with matters of leadership, staff and so forth. We would have quite in-depth conversations, and I valued Doris as a very good friend. She was in a difficult situation, I think, because among the professions, nutritional sciences did not rank at the top. Here she was dealing with the mega issues of business and law and so forth—rather high-powered units, not standing on the highest platform of what she had been in the past.

20-00:10:22

Rubens:

You had said she didn't have administrative experience, to your knowledge.

20-00:10:25

King:

She may have been a department chair. I just don't know. She was a remarkable person.

20-00:10:30

Rubens: You talk about her as being caring as well.

20-00:10:34

King: She was the one who had the penthouse at Morgan Hall as a lab. She would carry out these extended-stay nutritional experiments that related to astronauts and such people, whereby they would be under complete control and surveillance with regard to everything they ate and did. That was her research, was to study people's attitudes, behavior. How they did on various types of nutritional input. I've run into her name from people who knew her professionally quite a bit.

20-00:11:13

Rubens: Did you have a personal relationship with her?

20-00:11:17

King: She was, I would say, a very good friend. I would put it that way.

20-00:11:20

Rubens: Yes, that's what I was asking.

20-00:11:24

King: She was easy to talk with. It was not a situation where you would want to hold something back because it would somehow affect some other issue that you were dealing with. So it was okay to admit that you had a problematic faculty member, and then still go in and ask for a merit increase for that faculty member.

20-00:11:49

Rubens: Would people make end runs around the dean, or would the provost likely not accept that?

20-00:11:56

King: I suspect that the provost would not accept it, and it did not happen. Possibly the fact that that never happened could be rather unique to chemistry, in that chemical engineering was just not of a nature to do that, given the people who were there and the traditions. The chemistry hierarchy was pretty clear. It went from the chair to the dean, and even though here was this chemical engineer sitting there as dean for the first time, I'm not aware of chemistry having pulled any kind of end run.

20-00:12:35

Rubens: I think you painted a picture of collegiality and good working relationships.

20-00:12:44

King: Which I think was very important to the success and the stature of the place.

20-00:12:50

Rubens:

We've talked about the evolution of your own administrative style, and I think your nature was one to facilitate a certain kind of cohesion and consensus, even if there were times when we talked about—

20-00:13:03

King:

I've always taken the position with those next in line who report to me that what I'm here for is to understand their issues and help them. Sometimes that's a little difficult, particularly when you get up to the Office of the President and your line is, "I'm from the Office of President and I'm here to help you." I think it was appreciated. We may be getting a little ahead, but I think that was another one of the good things about the provost for professional schools and colleges setup. It put somebody in the position of being able to do that for the deans, who otherwise would be standing solo without anyone.

20-00:13:48

Rubens:

There was one question that our director, Richard, actually had. Just as we said we're going to defer discussion of Heyman and Park to when you become provost, I'm wondering if this one applies, too. He said that often, faculty who move into administrative positions are considered going over to the quote, "dark side," and that they're betraying their research mission, and so sometimes there's a lot of tension and fraught divisions, and that sometimes it involves rupturing old friendships.

20-00:14:27

King:

None of that. I think there are some reasons for it [being none]. One is that, since I had lived and breathed research and all the needs of faculty members my whole career, and my nature of administration was to try to understand the needs of people and actually help them, I don't think I was regarded as somehow being on the other side. That issue appears more as you get higher in administration, however, particularly once you're dealing with faculty with whom you have no prior relationship. In a sense, it was something to be overcome in dealing with the other twelve colleges and schools as provost of professional schools and colleges, and certainly it was something to be overcome dealing with the other eight campuses at the time, once I got to the Office of the President, because I'm a blank slate to them.

20-00:15:43

Rubens:

At least you're on campus during the years that you're provost.

20-00:15:49

King:

And I had grown up with all the people in the college of chemistry, so the relationship was already there.

20-00:15:57

Rubens:

Do you think we've covered everything? The one question that might tie into some questions Emily has—when you were made 100 percent time with dean, I assume you still had your graduate students?

20-00:16:09

King:

Yes, I did keep research going. In fact, I kept research going until the year 1999. I did have a quite substantial research group. I would estimate in the range of ten or so during my years as dean. I was teaching not a full schedule, but I was teaching. I did in fact keep the research going through all my years of provost of professional schools and colleges, and halfway through my provost position at the Office of the President, which was very difficult to do, given the geographical separation. But I did it. That relates back to your previous question, and let me make a comment there. One of the reasons—not the main reason, but a secondary reason—I kept going in research was that I thought that helped greatly in my relationship with other faculty, because here I was, still doing these things. I think it is different when you're in that situation from the situation where you have stopped research and you're now this opponent sort of person sitting in the dean's chair. You clearly don't understand what the researcher needs nowadays because you're not doing it. I believe the fact that I was actively doing research was quite valuable in all of those positions.

20-00:17:44

Rubens:

Good. Maybe that's a perfect segue.

20-00:17:52

Redman:

Before moving onto some additional disciplinary affiliations that you have held, I'd like to return briefly to both the Council for Chemical Research and the National Academy of Engineering. With the Council for Chemical Research, can you tell us a bit more about the initial formation of the council?

20-00:18:10

King:

Yes, I sure can. It really was the idea of a man named Mac Pruitt, who was vice president for research and development at Dow Chemical Company. It's interesting, because Pruitt himself was not a research person. He was somebody with quite a different background, but who had gotten into that position. Pruitt had seen a need to get the universities and industry much closer together in research. Now, why should they get together in research, and why was that a critical time? One reason in industry was that it was an era when the big companies were winding back their own internal research operations, and so they needed to get ideas, they needed to get research results, to feed into their systems, and they weren't going to be producing them internally as much as they had been. That was an industry-related reason to try to get a stronger research liaison with universities.

20-00:19:25

Redman:

If I could break in, that seems like maybe there's some sort of chicken-and-egg type of issue here. Did large corporations cut down on their own internal research knowing that they would be able to then work with universities, or was this research cut down without really a care?

20-00:19:45

King:

I believe the main driving force for the corporate cutback was internal economics and the fact that you cannot see research feeding the bottom line very immediately. You will have all kinds of research. Of the fifty different things you may have going on in research, one or two may succeed dramatically. Since that's such a small number, you may have them succeeding this year. You may go four or five years without a big success. It's unpredictable. In that sense, research has never been a very comfortable thing for corporate analysts who look at the financial picture of the corporation. So the pinch came on companies for a variety of reasons, and as they looked at their expenses, research was one that many of them thought they could cut back.

20-00:20:42

Redman:

Mac Pruitt, then, foresaw this need.

20-00:20:45

King:

Well, this was happening at Dow. He knew enough about the rest of the chemical industry to know that it was happening generally. I think the other thing that drove it in the minds of people like Pruitt was that there's always been a feeling in industry that the academic research is, shall we say, academic, in the sense of being ivory tower, kind of theoretical, not nailed close to reality. By having more liaison with the academic researchers, they could perhaps do things that would bring a greater realism, in their view, to academic research. Talking should help. Pruitt, back, I think, in 1978 or '79, called a national meeting in Midland of a number of industrial VPs for research of the chemical industry and of chemistry and chemical engineering chairs from around the country. I had not gone to this. That meeting, I'm sure it was orchestrated in advance that it would come out with the recommendation that there should be an institution formed, or an organization, at the national level, between the chemical industry and the universities to pay more attention to academic university collaboration.

The first I got involved was when, one day, I got a telephone call from a man named George Bugliarello. George, who has just died within the last year, was the president of what was then Brooklyn Poly[technic Institute], and is now a piece of New York University [NYU]. George had been on the steering committee for this meeting in Midland and was taking the role of working with Pruitt and others, to find the

relatively few people who would be put together to try to kick this off. He came to me and asked me if I would be willing to do this. I figured, well, this does suit me. I've had a lot of industrial interaction. It certainly is desirable to broaden our base of research support and get some industrial support in the picture, and I have always been one to believe that research is aided by a lot of talk with those who will use the results of research. That had come from my Proctor & Gamble consulting and things like that that we've already discussed. So I agreed to do this.

I think there were eight of us who were in this founding organization. Four were from universities. I think the others were all chairs of chemistry or chemical engineering departments, because there weren't other colleges of chemistry with deans. Then it was the research VP from about four major industrial corporations. Rohm and Haas was one. Eastman Kodak was another. And Dow, of course. Pruitt chaired this. We had the job of trying to define what might be a set of activities in a coordinating organization that could facilitate the bringing of industry and universities closer together in research in chemistry and chemical engineering. So we did that.

The organization that we defined was the Council for Chemical Research. We originally had a founding committee name. I believe the council itself may have been formed about 1981. It still exists. It was formed in 1981, because they had their thirtieth anniversary meeting this year. It built itself around an annual meeting that would bring together as many chairs and as many people from the companies as possible. Companies had to put in a level of support, financial contribution, to this. The universities did not have to put in financial contribution, but it was hoped and anticipated that they would attend pretty well at this. I would say it took some years to build it up. There was not enough widespread interest among the university chemistry and chemical engineering people so that people poured automatically into the first meeting. It grew as the years went on, and now I think it's pretty well attended. By that, I mean maybe even over half of those who would be eligible to attend. It has undertaken various projects. It has an office in Washington, which didn't exist in my time. In my time, the office was in Bethlehem, Pennsylvania, because Air Products and Chemicals supplied the man who was the original executive director.

It would hold meetings around the country, one place or another. We did have one here, which I remember quite well. They were all hosted jointly by a corporation at a university. Our co-host was Stauffer Chemical. I worked with a woman at Stauffer Chemical to organize this meeting we had. We started off with everybody in what was then called the Physical Sciences Lecture Hall. It's now Pimentel Hall. I

remember the start of it quite well, because we were to use a radio microphone system. The PA system and the large speakers on the wall of that lecture hall were turned on and the meeting was to start, and what came on was the police band for the Berkeley campus, not the person with the microphone down at the stage. We had to spend ten or fifteen minutes unscrambling that one, meanwhile finding out all that the police were doing.

20-00:27:36

Redman:

Publically!

20-00:27:37

Rubens:

What year is this, about?

20-00:27:39

King:

It's got to be about the fourth meeting, so it's got to be something like 1985. I was still dean at the time, so it has to be before '87. We would always pick a couple of years in advance where the meetings would be, and the company and the university would plan it. We would have common-problems type of seminars, but we would also have technical seminars, particularly built around areas where there was some ongoing industry-university research. We wrote such things as a model agreement between a company and a university that might help the tech transfer and licensing offices of universities and of companies not have to start from scratch in devising such things, but have a model to work forward from. We looked for a whole variety of things that could facilitate. As it turned out, this was going to happen anyhow, because the force that had started it off just became greater and greater and greater as the years went on. So now, I think, for the leading universities, at least, a typical number for the percent of their extramural research support that is from industry, in chemistry and chemical engineering, might be around 20 percent. So it's quite significant.

20-00:29:10

Redman:

I'm curious whether, in these annual meetings, the Council would structure sections for just simple meet-and-greets, to have face time between scientists and industrial leaders?

20-00:29:24

King:

There was a lot of that, yes—receptions and lunches and dinners. A lot of mix-and-meet type of time, but it was also a structured program, and it still is. It would try to stimulate new areas of research. Try to get things going there. It would provide lots of opportunities that were sort of a singles bar in nature. You would try to put people from companies and universities together under circumstances such that they could have enough technical discussion to go far enough along to see that there was some kind of true common interest. Of course, that common



interest might be with a faculty member of a department rather than with the chair, who was the one at the meeting, but then the chair should make the link. There was an effort to do the sort of thing that has been very effective at Gordon Research Conferences and at Engineering Foundation Conferences, as they were originally called, where you bring people from industry and people from universities together. You have explicit technical subjects, papers on them, lots of discussion, and the expectation is that you will make some matches from commonality of interest out of this. It has worked for all three of those endeavors: CCR, the Gordon Research Conferences, and the old Engineering Foundation Conferences. They've been effective that way.

20-00:31:08

Redman:

I understand that there's no real replacement for face-to-face contact, but has some of the utility of the council waned with the advent of the Internet?

20-00:31:19

King:

I think the internet affords other ways of communicating with one another, and good ways to follow up, but there's nothing that can match just simply face-to-face, human, social contact with regard to starting things off.

20-00:31:34

Rubens:

You said that the organization was working on a model of technology transfer. Did that lead you in any way to interfacing with the university's office?

20-00:31:52

King:

I happened not to be on the committee that produced the model contract, but I think it may have been the year that I was president of CCR that it happened, or close to that year. The model contract was just put out there. I know it got some use within universities, and I believe it got no use within UC. My contact with the tech transfer offices of UC came in other ways, such as when I would have an invention as a professor, I would deal with them, or then I had administrative relations with them later on.

20-00:32:40

Redman:

To go back to the initial formation of the council, did Mac Pruitt have any particular pull, or was the initial formation really just bringing together his friends, his acquaintances?

20-00:32:55

King:

Well, here's how it happened. There is, within industry—and there was at the time, and it's been longstanding—something called the Industrial Research Institute, IRI. That is a similar organization of VPs and directors of research from all kinds of companies, not just

chemical. These people knew one another from IRI. It was pretty apparent, in hindsight, that what Pruitt had done on the industrial side is to get people he knew already, and knew he could count on to think like he did, from his knowledge of them through IRI. Then, with regard to the universities, I believe his first effort was this grand meeting in Midland that he had called people to, to see what he could hatch out of that. I don't think that was particularly effective with regard to doing anything other than getting an endorsement for this committee of Bugliarello and others to move forward and try to assemble a working, founding committee to get things going.

Then, obviously, there was a lot of discretion exerted with regard to whom to put on the founding committee. These were all people who had inherent interest in this sort of thing, and also who were good at working with other people. I think we were pretty well pre-screened. He just put that group together, and then he was one of the eight. It must have met ten or twelve times before the launching of CCR. This was a long, difficult process, and it did involve such things as telling the industrial people what universities are really like, and industry people telling the university people what companies are really like. Went back to basics. Had all kinds of stuff that we had to chew over to get us all on a common track. I did a lot of traveling around the country, to one place or another, to meetings of that group. Mostly in Bethlehem, Pennsylvania—Allentown, actually, where Air Products is.

20-00:35:13

Redman:

You had said earlier that you were eventually president of the council. I had down that you were chair. Is that the same position?

20-00:35:21

King:

Let's say chair. It was chair.

20-00:35:24

Redman:

And that was in 1989?

20-00:35:26

King:

Sounds right.

20-00:35:28

Redman:

Was that a position that was just sort of rotating? Did you expect to become chair at some point?

20-00:35:36

King:

It was apparent that I probably would at some point. Actually, it was set up that there was an ordered sequence of chairs. I was probably the eighth chair. The first came from industry. So did the third, the fifth, and the seventh. The second was a chemistry chair. The fourth was another chemical engineering person, who had actually come in later than I, and it was a year I couldn't do it for some reason. Then the

same sequence again, to number eight, which probably what I was. I think that was important to set up that there would be this orderly sequencing to cover all types of people. It also meant that since the program chair for the meeting was the vice chair, next year's chair, that you always had an industry person and a university person working together on the meeting. All that was quite carefully done. It was very successful. As I look back on it, I think we did a very good job with regard to laying out an organization in a structure that could and would work. I also think it would all have happened, to a large extent—the growth in industrial support of research—would have happened even if we hadn't done it. But it certainly facilitated it. I guess the other test is, does it continue and does it continue successfully? It does continue successfully.

20-00:37:24

Redman:

Would you say that the sort of relatively slow involvement of the university side is just because the need was on the industrial side in the beginning and it wasn't quite so clear what the benefit was for the—

20-00:37:39

King:

Yes. Well, I think you're correct in that, but let's review the university benefit with regard to industrial liaisons in research and industrial support of research. The reason the need wasn't there as much for the universities is that there was massive government support of research. You could write a proposal then to the Department of Energy or NIH or whomever and get money to support your research. It was not really a matter of hankering to find some source that would support your research. A big source that would do it was already there. The slower process with the universities was in recognizing two things. One is that there actually was an advantage to this kind of liaison structure with industry, and that you could learn some things and get some insights that would be very helpful with regard to research and with regard to preparing your graduates for industrial careers. I think university people did, over the years, come to appreciate those aspects very well. The other thing for universities is that we have moved—and I may have mentioned this before—but we have moved over the years to a situation where you have to diversify your portfolio of research support. You can't have all your eggs in the basket of DOE or NSF. NSF's got only a 20 percent success ratio on proposals. DOE, for political pressures, can have ups and downs with regard to what they're able to support. You've got to have a variety of sources for research support. Industry tends to run on a different economic cycle from the government, and therefore it's a rather nice balancing factor in a diverse portfolio of research support.

20-00:39:41

Redman:

Was that becoming clear even in the founding years, or was it—

20-00:39:45

King:

I don't think that one, no. I think that issue of diversifying the portfolio and balance and so forth has just grown over the years as we've moved to where a grant was an unusual thing, immediately after World War II, to where you've got to have grants because you have no other source of financial support for anything in this day and age.

20-00:40:18

Redman:

How would you say that the council has changed in the years since its founding?

20-00:40:30

King:

I have to speculate some on this because as of when I went into the provost position, and certainly after I went to the office of the president, I couldn't be active in it. I couldn't produce the time to do the meeting. I think I was active in it some during my years as provost, but the Berkeley delegate had to be the dean of the college of chemistry, if the dean was willing to do it, and the deans were willing to do it, and both Brad Moore and Alex Bell, who succeeded him, actually became committee chairs. I think at least in Bell's case, he actually went through the officer ranks of CCR. In that sense, I sort of had to phase out, given the change in positions. I don't know the recent situation all that well, but my feeling is that one change has been a great broadening in the sheer number of universities taking part. I think another thing I started seeing in my day, and it may also apply for universities, but it certainly applies for industry, I started seeing that the level of the person from the company who was their representative to CCR went down bit by bit. Originally, it was quite high-ranking vice presidents of very large, influential companies. It moved to be people who didn't have quite that stature within their company, or who represented much smaller companies, and therefore with less broad influence. That's probably to be expected. I haven't done the same test with regard to universities. I'd have to dig in more to do that, but it would not surprise me if something of that sort had happened. On the other hand, it's pretty clear that it's for chairs of departments.

20-00:42:43

Redman:

Would you say that that's representative of the council being a well-oiled machine, or would you say that it's sort of a changing attitude within industry?

20-00:42:52

King:

It's the symptom of a maturing organization ripening. Then there's the question of what is middle age and what is old age. We won't dig too deeply there. It settles into something that's comfortable as the years go on. It is certainly true, just as it's true of some university people with a lot of pressure and heavy schedules, it's certainly true that a VP

for research in a big corporation has got an intense and heavy schedule. Invariably, you come down to making the decision of, well, will I go to CCR, or will I instead go to our plant in Korea and address the immediate problem that has flared up there? As it went on in years, it was a little easier, I think, to make that decision in the direction of doing the other thing.

20-00:43:57

Redman:

If you don't mind, I'd like to return to the National Academy of Engineering. We've talked a bit about it. Just for the record here, could you describe the academy in general terms? What is the National Academy of Engineering?

20-00:44:15

King:

It first and foremost offers recognition for engineering accomplishments, so it is supposed to pick and have as members people who have been the most important accomplishees and/or leaders of the engineering profession. It is to some extent a Johnny-come-lately in that it was started well after World War II, in 1964. The National Academy of Sciences, which goes back to the Civil War, long preexisted the Academy of Engineering. There had always been a question of the status of engineers within the National Academy of Science. To what extent was engineering as an accomplishment recognized? Should there be something separate for engineers? So anyhow, it broke off, if you will, from the National Academy of Sciences, but stayed within what is called the National Academy Complex. Right now, there are three—actually, four—bodies within the National Academy Complex: the National Academy of Sciences; the National Academy of Engineering; the Institute of Medicine [IOM], which is the same thing but for the medical field; and then what is called the National Research Council. The National Research Council is the working arm of all three academies. It oversees and puts on all of these studies on one thing or another, usually requested by various arms of the federal government.

The National Academy of Engineering has, to some extent, had an identity crisis over the years as to what it is other than a recognition society. So a lot goes into the election process. There's a very formal procedure and deadlines and methodology for nominating people. They're not supposed to know they've been nominated, so there's a lot of busy behind-the-scenes work. Then there's a peer review committee for each of what is now twelve sections of the academy. One of them is chemical engineering. That peer committee chooses, from among all of those nominated, the people that they believe are most deserving of membership. That goes to something called the committee on membership for further judgment, and then it gets sent out to the entire

membership of the academy for voting. There's a lot of process and a lot of importance attached to the election and recognition process.

Now, with regard to the working arm, the National Research Council has been there a long time, and the National Academy of Engineering has a lot of involvement in it. What it does is studies on one subject or another, sometimes initiated by the NRC, an academy itself, but there's got to be a funding entity, and so much more often initiated by request from a government agency: NSF, Department of Commerce, Department of Energy, Department of Interior, occasionally Congress, and occasionally some other type of organization or society. Then once the NRC has agreed to do a study on something or other, there's a big procedure on that. There is a lot of involvement of different people in deciding whom to put on the committee, who should be chair of the committee. They do their study. There is then a lengthy review process. Many think it's much too lengthy a review process. But anyhow, you'll get nine or ten other academy members to do the reviewing of whatever is put forward by this committee, and then it becomes a report. It will be interesting, when we get to it, and I presume it will be later on, to contrast this with the California Council on Science and Technology, which is, in effect, a National Academy Complex, or NRC, for California. It's done differently in California, but we probably ought to wait until we get to that part of my career.

So that's what the academy is. Sometimes the academy will do committee work. I'm right now on one to help redefine the academy's efforts with regard to engineering education. They have had an operational effort that's an arm of the academy that I've been chair of the advisory board for a number of years. The head of that left to become Executive Director of the American Society for Engineering Education, so that has led the academy to want to readdress just what they do relating to engineering education. That's why I'm unavailable July 27, 28, and 29. There's a meeting of that.

20-00:50:20

Redman:

Before we talk about your committee work here, I'm interested—you had said that there's sort of an ongoing question about what the National Academy of Engineering does, other than just recognize talent. Is there the same sort of question in the National Academy of Sciences?

20-00:50:39

King:

Yes.

20-00:50:42

Redman:

So it's not that this breaking off caused this problem, it's that this was sort of already—

20-00:50:46

King:

No. The same question appears and occurs within NAS. Of course, the prime answer to that question for both organizations is the National Research Council. Now, it is rankling to a number of engineers—not particularly to me, but to a number of other engineers—that the president of the NAS, who is presently Ralph Cicerone, an ex-chancellor of Irvine, is the president of NRC, and the president of the National Academy of Engineering, who is now Chuck Vest, the ex-president of MIT, is the vice president of the National Research Council. It says something about who has the final deciding power as to what the National Research Council does. I think as long as you've got the right two people, they can work together very well.

20-00:51:43

Redman:

I'll actually save the first committee for last. You had mentioned the committee that you're on now, but you were also on the academy section three, the chemical engineering section, and the peer committee for general engineering, a committee on solvents, committee on chemical engineering. Are any of these worth talking about here?

20-00:52:05

King:

The one that is worth talking about is the committee on the future of separations and purification. I don't remember the distinction between the name of the committee and the name of the report. The report is Critical Needs and Opportunities in Separation and Purification. That's the biggest one. That was quite an interesting effort. I did go through, as many people go through, being member and then chair of the peer committee. That's the group that sifts through the nominations and decides whom to put forward. That changes from year to year, so everybody does that at one time or another. Only within the last ten years or so have they had actual officers of the sections. That's done so that that leadership can be used to nominate people to be on committees, to nominate reviewers for reports, and at the annual meeting of NAE, which is in October, an entire afternoon is spent on a meeting of the section, so what should the section do at the meeting? That's what the chairs of the sections are doing now. Yes, I went through that for section three also recently.

20-00:53:36

Redman:

I think this was your first committee with the National Academy. You served on the peer committee for biotechnology, and that was a startup committee.

20-00:53:47

King:

That was a startup. That was a startup section, and it had to do with the rise of things biological within engineering activities. One of the twelve sections now is called special fields, or "other", if you will. Bio

had been in “other” for years, and it was finally decided at the academy leadership level that bio would be deserving of a section, and therefore a peer committee of their own. Now the problem was that there were no members of that section and you somehow had to start, so people already in the academy who knew something about biotechnology were assembled and put together to do this. I’ve always had a tinge of biotechnology to me because that’s a very critical and interesting application of separations. The typical description of a pharmaceutical plant is this, that you have the building with all the fermenters and reactors that make horrible mixes of whatever it is, along with whatever pharmaceutical you’re trying to market. You ship this all in a pipe over to the next building, which is full of separations, and it’s all kinds of separations. It’s very interesting and very challenging that way. In that sense, and because of my involvement with food industry separations, that’s what led to me as being one of those people to start that section up.

20-00:55:27

Redman:

What were the particular challenges? Obviously membership, but were there any other sort of major challenges in starting up a new section?

20-00:55:36

King:

No. It was mostly being able to exercise judgments as to who should be the initial members of the section.

20-00:55:46

Redman:

Your work in that wasn’t handpicking members, is that the case?

20-00:55:51

King:

That was also nominations and judging, and so the peer committee did the peer committee function. It’s just there weren’t any existing members explicitly associated with that area to draw from for the peer committee, so they had to draw from other sections.

20-00:56:07

Redman:

Were the members of this new section brought in from members that were already part of the National Academy or?

20-00:56:21

King:

Oh, no. People could apply to transfer their section, and I’m sure that some did that, but no, mostly it was a matter of looking for people who were not yet members of the academy. If we look at it this way, a section is going to look for, find, nominate, and pass on the names of people whom the people in that section know well. Let’s take something like the bio area. It’s partly in chemical engineering. That is, there are some chemical engineers who do it. There are some electrical engineers that do it. There’s some materials scientists that do it. It, in those days, it would form 2 or 3 or 5 percent, at most, of the profession of these other sections. It was a real minority within any



one section. It was unlikely that these bio people were going to get the attention that the importance and worth of the field deserved, and so that was the reason for creating an additional section, was to get people who would be chosen, looking now at bioengineering as a whole, and not as just pieces of these larger, older, more traditional component disciplines.

20-00:57:59

Redman:

Was there any sort of competition with the National Academy of Sciences? Was there a section there that might have some overlap?

20-00:58:09

King:

No, that was quite separate. In fact, the membership issues have always been unrelated between the two academies. Between the three academies, counting the IOM.

## Audio File 21

21-00:00:03

Redman:

I'd like to talk now about the National Research Council. You described what this was, so let's just jump into it. In the mid-1980s, you were chair on the NRC committee on separation science and technology. Can you tell us a bit more about that committee?

21-00:00:38

King:

Yes. One of the things that the research council and the academies do is studies of different fields to try to identify what is the most needed research and what are the most promising areas for future research. This is of help to government agencies with regard to picking their portfolios. It also, obviously, is of help to the field, too, because as soon as any study or report of this sort is done, it becomes something that is distributed and which researchers in the field will then point to as rationale or justification for the research that they want to do. It has two audiences in that sense: the researchers in the field and those agencies that support research in the area. The National Research Council is divided into boards that cover broad areas—divisions and boards. One of these is chemical sciences and technology. It had done studies in chemistry from time to time. In fact, one of these studies was effectively chaired by George Pimentel, who had been a professor of chemistry here at Berkeley. It had not been done much within chemical engineering. I do not know exactly how the idea started. It did not start with me, and it did not, as best I could tell, start within the field of separations. It started some other way.

I think it was Bill Corcoran, who is a professor in the division of chemistry and chemical engineering at Caltech, and an academy member, came to me and aired this idea out on me. I believe I was invited to a planning meeting in Washington, where others who might

be interested in the area and some membership of the chemical sciences and technology group would listen to the discussion, participate in the discussion, of whether to decide to proceed. There was a decision to proceed, and that led to a study that must have taken at least three years, if not part of a fourth, to try to define what were the needs at the time. What were the most promising areas for research in separation and purification? It had both academic and industrial membership. It had leading people from the field. The way it worked is that it was staffed by a member of the National Research Council permanent staff. The one who staffed this [one] was a fellow named Bob Simon, who later moved from the National Research Council to the Department of Energy as principal staffer to Admiral Watkins when he was secretary of energy. Then Simon went on and eventually, later in life, was staff to congressional committees, some of which dealt with nuclear weapons. I ran into him again once we got to the nuclear weapons question. I was in OP at the time.

We were given free charter to work as a group to define these areas. We did an assessment of the field. We went through many, many drafts. The way this is done, the National Research Council provides writing services to you. I never actually had to sit down and write a whole draft. Bob Simon did that. Then we would meet, meet, meet, and revise, and get agreement upon revisions. This will show you some more about how the academy and NRC processes work. We did all of that, then we had to go into what was a yearlong review of the report. There were I think seven or eight reviewers who were anonymous. We didn't know who they were. They dug in quite deeply. That brought us back into some additional meetings to examine what the reviewers had said and dealt with that. It clearly is a process oriented in consensus, and therefore such full agreement as there can be to what the needs and opportunities in this case really are.

That was a report that stood the test of time pretty well. In fact, I looked back at it in 2008 as I was asked to give a talk at the hundredth anniversary meeting of the American Institute of Chemical Engineers. Of course, for somebody who's left research, that's a big challenge. You're asked to give a talk on a subject of your choice, but what can be the subject of your choice? I looked at the progress of the field, and with that, went back and looked at this report from the mid-eighties. In a very good sense, I think the crucial issues and needs identified there remain as crucial issues. Maybe the bad part of it is that they remain as crucial needs, meaning there hasn't been all that much progress towards them. But I think we did that job [of defining the needs and opportunities] pretty well. It was a very intense experience for those of us involved. We all came to know one another very well. Some very lasting friendships came out of that.

21-00:06:40

Redman:

How often did the group meet?

21-00:06:43

King:

Oh, it must have had twelve or fifteen meetings. These would be daylong meetings. You'd all come to Washington and use a room in the National Academy building there on Constitution Avenue. Lunch was brought in. It was a very intense and thorough meeting, and very tiring. In those days, I could do that. I could chair a daylong meeting of this sort in Washington, and then get out to Dulles Airport, then go back to California. Now I try to come back to California the next day.

21-00:07:26

Redman:

That's wise. At around the same time, you were also the chair of the board of assessments for the National Bureau of Standards. I understand that this was also related to your position on the review panel for the National Engineering Laboratory. Is that correct?

21-00:07:47

King:

The board of assessments is something that was set up by Congress a long time ago, I think in the fifties. The Bureau of Standards, which is now called the National Institute of Standards and Technology, was treated in a way no other government research entity has been, to my knowledge. It was asked of the National Research Council to take on an ongoing contract to provide evaluative reviews of the work at the Bureau of Standards in a way that would be public reports and were, in fact, systematically fed to Congress. Within the Bureau of Standards, there are various subcomponents, and about half of the bureau was at that time called the National Engineering Laboratory, so it was [the committee for that half of the bureau that I chaired. I was on the committee for many years, and then chaired it for some years. It's an interesting function, and it was an early exposure to the need to write an evaluative report in a public setting, knowing that all kinds of things might happen as a result of the report being public and the ways in which it was used.

Let me make a little diversion here, because there are things about this that are an interesting history. The way the board of assessments and the need for that came about was in the fifties, and it was at the time that Allen V. Astin was the director of the Bureau of Standards. I knew what was going on at the time for an interesting reason, which is that my father, who had charge of R&D for the Army Signal Corps at the time, had a lot of interaction with Allen Astin and with the Bureau. He would be there very often and know exactly what was going on. The issue had arisen around a battery additive by the name of ADX2, which was ultimately concluded to be something that didn't work. Bogus. Astin had the Bureau do some work on it, and in a way that

was played up in the press as being effectively a Bureau endorsement of this battery additive.

21-00:10:37

Redman:

Was it?

21-00:10:37

King:

My father's view on this at the time was that Astin was being improperly assailed, that that wasn't what the bureau had done. I remember that happening very well. It was because of that that, A, Astin left the directorship of the Bureau, and B, the board of assessments was set up. Then I come back in with the board of assessments later on. There's another interesting college of chemistry tie here, too, in that one of the very close associates of G.N. Lewis was Merle Randall. Merle Randall was, in a sense, the first chemical engineer at Berkeley, but long before it was called chemical engineering. What he did looked like chemical engineering. There's a very famous Lewis and Randall thermodynamics textbook. Randall had had some involvement with this battery additive and was one of the persons cited by those who wanted to push the validity of the battery additive. In that whole episode, there was a Berkeley component, too. Now, what's interesting is that, later on in life, I catch up with the Astin family, because here I am, directing a Center for Studies in Higher Education at Berkeley. Alexander W. Astin was the longtime director of a very comparable center at UCLA, and very respected within the field of education. He was the son of Alexander V. Astin, and he also had a sibling of some note, who was John Astin, the portrayer of Gomez on *The Addams Family*. Small world, department, hugely so.

Just another side remark on Merle Randall, who came into that story. He had been involved, during the time of the Manhattan Project, with trying to distill heavy water, the deuterium isotope of hydrogen, away from the normal isotope of hydrogen. That separation is done by distillation, with lots and lots of stages, because it's a very close separation. There's not much difference between the molecules in volatility. In Lewis Hall, which had been built in 1945, there are utility chimneys, which go from the basement up to the third floor. Randall took advantage of that and built distillation columns in those utility chimneys. He wanted to use a packed column and he had to find a packing. Packing was in very short supply during World War II. He finally came up with what he could in the way of packing, and it was shoe eyes. This is a shoelace eye. Here are these big, tall columns, full of shoe eyes, and then it ended up that my laboratory was in a room that had this shoe eye conduit as an indentation into the room. Things relating to that episode kept bouncing up on all sides.

21-00:13:58

Redman: Was it still full of shoe eyes?

21-00:14:00

King: No, the shoe eyes and the distillation columns went away, and it wasn't anywhere near enough height for the distillation column to do the heavy water separation [effectively].

21-00:14:12

Redman: How did you get to be chair of the board of assessments?

21-00:14:19

King: I was asked to be a reviewer for the chemical engineering—or maybe it was called chemical processes—subcomponent of that board, which is an advisory committee to the board. I did agree to do that, and I believe that my involvement with separations was the reason I was asked. They had work in separations. For several years, I was on that, writing my evaluation of the separations programs. Then, as things often had it for me, it was then decided that I would make a wonderful chair of that group, and so I was chair of that group, which put me on the board of assessments for the National Engineering Laboratory. I struck it off rather well with John Lyons, who was the head of the National Engineering Laboratory. He probably had to put it to the academy—yeah, it had to be the academy that he put it to—that it would be good for me to chair the group for the National Engineering Laboratory, and so he proposed that. I agreed to do that and did it.

21-00:15:30

Redman: My apologies if this is clear on the record, but I'm still a bit confused about what exactly is the National Engineering Laboratory.

21-00:15:37

King: It's half of the Bureau of Standards, or it was at the time. The bureau has had many different organizations over the years, and in fact now has a totally different name. The Bureau of Standards is located out in Gaithersburg, Maryland. It originally had buildings in downtown Washington. Its original function was to do things like keep the standard clock, or the standard kilogram. That kind of thing.

21-00:16:04

Redman: They don't still do that?

21-00:16:06

King: Yes, they do still do that, but it's had many other functions added to it. At the time, I will guess that they may have had something like three hundred scientists within the Bureau of Standards. It was organized. It had a division for chemical things, and a division for probably biological things, and a National Engineering Laboratory, which was all those things that dealt with engineering, and it did include the standard kilogram and things of that sort. The board of assessments

just divided itself up to parallel the organization of the Bureau of Standards. That's why there was a committee for the National Engineering Laboratory.

21-00:17:05

Redman:

I in no way mean to be offensive, but why is the National Engineering Laboratory half of the National Bureau of Standards, which certainly deals with so many things?

21-00:17:19

King:

I think it was a pretty loose definition of engineering. All things in Washington have their huge political components. I think John Lyons was quite influential within the bureau, and in that sense probably ended up, as a good manager, being given a lot of the bureau to manage.

21-00:17:45

Redman:

In terms of "given a lot of the bureau to manage," are you talking about solely administrative control, or also physical space?

21-00:17:59

King:

Or programmatic. The Bureau of Standards works sort of halfway in between a university and an industrial corporation. In a university, all of the individual faculty define their own research. Chancellor, dean, or anybody else does not tell them what to do in research. It would be contrary to the whole idea. In industry, you do get told what to do on research. A lot of the function of the directors and vice presidents of research is to define what it is that their people shall do in research. The bureau is something sort of halfway in between. A lot of individual initiative, but also a need to orchestrate, to find, and control, and make sure the efforts are in the right places from a managerial level. That's the kind of management that John would have been doing there.

21-00:18:56

Rubens:

Was this a governmental entity?

21-00:19:00

King:

Yes, it's part of the government. It's part of the Department of Commerce. It's a whole campus out in Gaithersburg, Maryland.

21-00:19:02

Rubens:

That's what I thought. So those three hundred scientists are employees?

21-00:19:10

King:

Yeah, they're government employees.

21-00:19:13

Redman:

What was your actual role on the review panel for the National Engineering Laboratory?

21-00:19:20

King:

It changed over time. Initially, I was brought on there just to look at the particular projects in separations that I would know something about and could evaluate and do the online evaluation. As I moved up more to these chair and all-board levels, it was more a matter of making sure that this had all been done right, that there were checks and balances, that the different parts of the bureau were being treated equitably in terms of the nature of the review.

21-00:019:52

Redman:

So it was administrative?

21-00:19:53

King:

More administrative, yeah.

21-00:20:00

Redman:

I assume, at that point, all of this would have to be done onsite, so you would go to Gaithersburg?

21-00:20:05

King:

Yes.

21-00:20:07

Redman:

How long were you involved?

21-00:20:18

King:

I will take a guess that it was something like seven years, start to finish, that I was involved with them.

21-00:20:30

Rubens:

So you started '87 to '89?

21-00:20:34

King:

That's probably the National Engineering Lab one, but I would have been doing it for some years before that, and I may not have put those years on the resume.

21-00:20:41

Redman:

I have, right here, mid-1980s, so not very precise, but a little earlier than 1987.

21-00:20:49

Rubens:

Eighty-four to eighty-six.

21-00:20:51

King: The fact that they could have a dean doing it was useful to them, too, because part of this is: do the leaders of your evaluation process cut the mustard, stature wise, with the Congress or with anyone else?

21-00:21:10

Redman: Did you ever have to deal directly with Congress?

21-00:21:13

King: Not on that one, no. I have had some dealings directly with congressional people, but they've almost all been on behalf of the University of California rather than one of these other things.

21-00:21:30

Redman: I would like to move on to the National Science Foundation [NSF]. You've been on some committees, and I'm not sure if you want to speak about any of them in particular. You, I think very early on, were on the subcommittee for chemical and process engineering, that division there. You eventually became chair of that. Is that a committee that is worth discussing here?

21-00:21:57

King: This is also an assessment and evaluation committee, but not public. The report just simply exists there within the NSF for the use of NSF's management and other people within it. Within NSF, there are a number of different directorates. One of those directorates is the directorate for engineering. Then, within the directorate of engineering—this again gets reorganized all the time—but typically there is something around five or six constituent program areas or divisions. Then there are programs within divisions. When you mentioned chemical and process engineering, that was a division, more or less parallel with chemical engineering's role within all of engineering.

21-00:22:52

Redman: And that was in the chemical engineering directorate? Is that how that worked?

21-00:22:57

King: It's within the engineering directorate's division of chemical and process engineering, and then it would have constituent programs. Another thing that happened, they had names like transport or kinetics and reactors. It is during my time of involvement that they ended up with a [separations] program area within NSF. I'd forgotten that one until you asked me this. One of the program areas within what amounts to the chemical engineering division of NSF is separations and has been. They will call in review committees to meet for a couple of days and look at what they have supported in the way of research, how many applications they're getting in what area, what the success



rate of proposers is, how well are they doing their job as program directors. So I did that one.

Then I became the chair of that committee for some years, for the chemical and process engineering division. That put me on the committee for the engineering directorate, because the chair of each of those division advisory teams would be on there. I saw, I think, three different directors for the engineering directorate. It's an interesting situation because NSF's management is two kinds of people. One is the forever government post civil service type people, and the other is the rotators. NSF has a lot of rotators. That's one I didn't do. I was never a rotator at NSF. They do have many, and they come and they go. The heads of the engineering directorate would typically be rotators. The interesting thing is that there was a tendency to pick people who had rather firm convictions about what was important and what needed to be done. You then got yourself into a mode of, every three years or so, who was director of that directorate would change. The new person would come in with a whole array of brand-new ideas and desires and ways of doing things. It led to a turbulence in programs and program emphases that I believe has actually had a negative effect on the research field. It's destabilizing to the research field with these priorities changing so much. Now, it may have been just the particular years and the particular three directors I was exposed to, and it may not happen all the time, but I did find that to be quite an interesting phenomenon.

21-00:26:15  
Redman:

You might not know the answer to this, but I've spent some time with some archival materials from the NSF, and you see the same sort of turbulence and re-envisioning of the missions of various directorates, renaming things, restructuring. Did you see this happening in other sections or were you really just isolated from the rest of the Foundation?

21-00:26:40  
King:

I was isolated from the rest of it. You don't surprise me for a moment by saying you think it happens in the other directorates. I'm sure it does. I've had some exposure to chemistry, and above it, math and physical sciences. They've had some turbulence, too.

21-00:26:58  
Redman:

I'm asking this really for my own curiosity, and it depends on how long you were there, but did you see any major changes as attached to changes in federal administrations? Did you see changes then trickle down into the NSF?

21-00:27:17

King:

Of course, changes in federal administration can result in a change of the directorate of NSF. Yes, I think there was quite a large one. I'm going to have to think a bit to place it in time. There was a period of time when it was decided at levels outside the foundation that much, much more industrial influence was needed in the foundation. That's when Erich Bloch of IBM became director of the NSF. He was a good director, but the political pressures of the time were also much more towards industrial emphasis. That is a place where there was a swing at the very top that did influence that [i.e., what the Foundation did]. Erich was director while I was doing this, and he would come before our engineering directorate group. I actually found him quite good. I don't think he was all that different from all the other NSF directors, but of course, occasionally, a good bit of rumbling down in the ranks in the universities.

21-00:28:27

Redman:

Was he brought in with Reagan? Is my timeline right there?

21-00:28:34

King:

Those probably are the years, yes. I think he was a Republican appointee.

21-00:28:42

Redman:

Do you remember any of the specific advice you gave in the advisory committees? Was the NSF doing a good job?

21-00:28:52

King:

I honestly don't. I don't possess any reports that were written from then. I don't have them to look back on. I believe that most of what we did had to do with advice with regard to where it would be good to put some more emphasis. One thing we did have was that RANN, Research Applied to National Needs, had been around. That was an early effort to try to swing the foundation more towards things of direct use to industry. We looked at RANN and we evaluated what had been done in RANN, and we evaluated what had been done in various successor programs to RANN that had different names. We advised with regard to the organization. We advised with regard to how to assure fair reviews. In fact, I believe I was even once on a panel that looked at decisions that had been made by probably the chemical and process engineering division. Sort of audited whether they had been done right, in a fair way.

I remember also the engineering directorate board having been brought in to strategize with NSF on how to demonstrate or prove the worth of NSF-sponsored research. It's always an issue for research. I described it back before in another context. NSF, of course, would have a huge number of things they supported, nearly all of them at the very earliest

stages of research and development. The nature of this study had been to see what had progressed from NSF support through to a patent, and through to an impact on society that relied on that patent. I've been on a number of such things over the years, and I remember the result on this one, and it's been the result almost everywhere else, too. One patent made all the difference. One. With that one patent, NSF had been a huge payoff for the country. Without that one patent, it was much harder to prove it, because there was not the direct route through patents. We were looking at maybe a ten-year period, which might as well have been zero patents, or might have been three patents, that paid off. The statistics was small numbers that are in play here. It's a very accidental and fortuitous thing with regard to what you will find on such a study.

21-00:32:12

Rubens:

What was that patent?

21-00:32:13

King:

I don't remember. It was not chemical.

21-00:32:25

Redman:

I'm also interested, later, in the 1990s, you were chair of the panel on separations technologies for the Japan Technology Evaluation Program. Can you explain what that program is?

21-00:32:44

King:

That's yet another government activity. The Japan Technology Evaluation Center (JTEC) had been set up. I believe it was administered at an Eastern university, Loyola in Maryland. It had continual support from the Department of Commerce, and then, on an ad-hoc basis, from other government agencies. The idea of this operation was to look at what was happening in Japan. You remember, back in the eighties, and even into the nineties, there was great concern in the U.S. that Japan was an oncoming economic force. They're going to take it all away from us, et cetera. The idea was that they [JTEC] would identify certain fields, and then they would send teams to Japan to find out what was going on in research and to assess where that stood, competitively, with the research in the U.S., which we collectively were supposed to know among ourselves. Lots of narrative in this, but the ultimate assessment is, is the U.S. ahead, is Japan ahead? Is Japan a stronger vector than the U.S., such that Japan will move ahead, or not?

That was quite fascinating. I think the team was about seven people. We went, in the course of a week, to about twenty different places in Japan. Not all together. We divided up some. The results of that were rather interesting because what it showed to us is that—the field was, of course, separations, so that's what we were looking at—the

strongest research and the most competitive developments were occurring in the companies, in the corporate research. The universities were not able to move much towards commercializable research. They didn't have the proper facilities, they didn't have the level of support. Then there was a third arm of it in Japan, which was national laboratories, which had a different role from what the national labs have in the U.S. The role in Japan was to take things that had been invented somewhere else in Japan, or maybe in some other country, and develop them further. I remember a particularly interesting innovation we found had been invented and initially researched and developed within Kobe Steel Company in Kobe, Japan, and had been taken by one of the national laboratories, who had, in many ways, repeated the research done in the Kobe Steel Company. It was not awfully apparent what the value-added of the large effort in the Japanese laboratories were. Well, that was a negative thing, but there were many positive things as well.

My recollection of our final judgment on that report is that there were some areas in which Japan was ahead, there were more areas where the U.S. was ahead, and that Japan had a pretty good vector. It might be interesting to point out that that program later changed from JTEC, Japan Technology Evaluation Center, to WTEC, World Technology Evaluation Center. They continued doing studies and reports of that sort. It's done in all areas of technology, to look at it. I think it's a good thing for the U.S. It gives some sense of where we stand with respect to the rest of the world.

21-00:36:46

Redman:

Were you there with also industrial engineers?

21-00:36:58

King:

Yes, we would have industrial people on the team. For JTEC, I put the team together. That was not true for all things of this sort, but for that one, I did [it]. I remember at least three industrial people. One was a person I had run into at Cargill Corporation. They organize things differently, but he had been in the corporate position of chief technology advisor—the rest of the company is all organized by divisions. He cut across all the divisions, thereby a very wide viewpoint and knew a lot about biology and pharmaceutical matters, which was a lot of our review. We had to bring in complementary expertise. George Keller, who has worked with me for many things over the years, was a member of that also. His career was Union Carbide until it went away and was bought by Dow. He's now with a company that utilizes the laboratories left behind, and development facilities left behind, by Union Carbide in Charleston, West Virginia. They have their own R&D corporation, not unlike SRI, Stanford Research Institute, that does R&D there. George had a long and very

distinguished industrial career. Very intensely interested in separations. He and I did many things together, and that was one of the things we did. A third was Bill Eykamp, former CEO of Koch Membrane Systems (yes, the same Kochs).

21-00:38:44

Rubens:

When you went to Japan, was that the first time you had been to Asia?

21-00:38:49

King:

Oh, no. I had been there before. How did I get to Asia? Well, I went to some scientific meetings. Kyoto was one I remember. The first time I was in China was the first China-U.S. chemical engineering conference, in 1982, which was something like three years after the end of the Cultural Revolution. Quite interesting. Everybody in Mao suits. Not very advanced in science and technology. That has changed over the years. The ways I've gotten to Asia, one is just through technical meetings, of which there's some examples. I also went to Asia, notably Taiwan, in connection with college of chemistry fundraising, once we got into that. Then I've been there for all sorts of education things in more recent years, to China and other countries. I've been there and watched it change. I've been to China three times: 1982, 1997, and 2010. The country has just had undergone total change in each of those intervals. Absolutely amazing. I've never been outside of metropolitan Beijing, but it's Beijing I'm basing this on.

21-00:40:24

Rubens:

I don't think we mentioned that about fundraising, you going to Asia.

21-00:40:32

King:

We used what contacts we had, starting off from the beginning, in the college of chemistry. We did have some good contacts in Taiwan, contacts that Y.T. Lee had made before he went over there. I may have mentioned that one of my very first graduate students, Mao Kao-Wen, was minister of education and then head of the civil service—actually called the “Examination Yuan,” which is a big, big position, and then before that, had been president of National Tsing Hua University in Hsinchu. So he was an avenue. Then as we got going on this, and Jane was quarterbacking me on how to do it, we did find one very major obstacle, which is that Taiwan at the time had a law that no Taiwanese could take money or send money outside of Taiwan. That's rather a dampener on a development effort.

21-00:41:34

Redman:

To sort of close the segment on the National Science Foundation, you had mentioned that the turbulence caused by the change in directorship was a negative. Could you go back to that and talk a little bit more about that?

21-00:41:52

King:

Division directorship? I think what it meant was that what were the initiatives and the desired changes at NSF would change every three years as a new director for that division would come in. That meant that the initiatives didn't have a very long lifetime. You could be started off on some new initiative. It may have just been gaining momentum, and then it would be dropped and some other initiative would start. It was as if you were living in a world that was dominated by initiatives that weren't the same. People cannot change their research or their research emphases on that kind of timetable. That's the problem, and that's why I had the reaction that it is, in some sense, a destabilizing influence that way.

21-00:42:47

Redman:

How much did this restructuring impact sources of funding? I assume that when subprograms get renamed, that also is directing what types of research get funding, what categories are.

21-00:43:06

King:

That's correct. It does mean that the portfolio of available support for research for different fields and sub-fields changes over time. Of course, it's also a characteristic of our U.S. system that the support of research is divided up among a large number of government agencies. NSF is not that big a fraction of the total government research support capability. That all happened in a Topsy fashion; it just grew like Topsy. It did not happen by grand, overall design. The result of that is that there are some very important areas of research that have very few places within the government that might support them. If you're in one of those areas, it's a very critical change if NSF was putting big emphasis into it and now isn't. There may not be much in the way of an alternative. There is, in many ways, wisdom and health to having the large number of different agencies that support research. It allows for second chances. It isn't all dominated by what happens in once place. It allows for different viewpoints on what's important and so forth. It does make for a not very designed or coordinated system of support of research, and it can create these vulnerabilities for a particular field. NSF has the position of being the agency of—you could say -- last resort, or of universal resort. That is, it supports all research, whereas the Department of Energy focuses on energy; the Environmental Protection Agency, environment and so forth. NSF is the one that's always there as a possibility, and so a change of some nature having to do with NSF has a wide, broad effect with regard to people who would try to get research support. That to me says there's reason for it to try to retain stability.

21-00:46:19

Rubens:

The other thing we should cover is a few external reviews of universities.

21-00:46:28

King:

I was on advisory boards to Wisconsin, New Mexico.

21-00:46:32

Rubens:

And later, Yale.

21-00:46:35

King:

Yale is worth some conversation. Yale is worth a good bit of conversation. This is just a preview of what we're going to do, right? First of all, you've got to realize the situation at Yale. Yale and Harvard have both, historically, not really known whether engineering should be part of a great liberal arts university. In that sense, engineering's position at Yale has been tenuous at best, with many ups and downs and backs and forths over the years. I think we talked about this a little bit, maybe back in my student days. It was secure then. There was a school of engineering that had a dean, departments, twenty chemical engineers, 120 engineers out of an undergraduate class of 1,000. A lot of engineering. That had very tough times over the years. My involvements [were this.] When the chemical engineering department, being down at a level of five faculty members and one to two majors per year, one thing they did was start up an advisory board, which was a fairly conventional advisory board. There wasn't anything very unusual or different about that. The thing that did become different is [my involvement with] University Council, which is '88 to '93. That's twenty members, all of whom are Yale graduates, all of whom chair a five-year study of some field. My field was physical science and engineering. By contrast, there were three members and three five-year studies on social sciences, one on the Yale Daily News and so forth. It just shows you again where engineering is at Yale.

We had an extremely critical time. We were doing our study, what should be the future and done for both physical science and engineering. We had Nobel Prize winners and whatnot on the committee. We hit that point in time where the president of Yale, Benno Schmidt, had decided that the faculty must downsize by 15 percent so as to liberate money for redoing the whole physical plant. That wouldn't happen at Berkeley. The president could not make that decision, or chancellor. But it did at Yale. This all set up a process at Yale that was the antithesis of the Academic Senate. It was a very different process. The senate would have made this work better. Ended up with a report appearing in everybody's mailboxes one Monday morning, saying, okay, this is how we reduce the faculty by 15 percent. We get rid of linguistics, sociology, and engineering. Here I've done this big study of engineering and physical sciences, and we're in year four, the end of it is year five, and engineering is about to be abolished at Yale!

21-00:50:30

Redman: You'll have to make a doorstep!

21-00:50:35

King: So it hits the fan, literally.

21-00:50:40

Rubens: I think Neil Smelser is called in about the sociology department.

21-00:50:45

King: I've never talked with Neil on that, and I'll bet you he did have a role there. I was sitting right in the middle of the engineering one, and it included strong feelings by the engineering faculty that we had betrayed them. We must have said that it was far too expensive to resuscitate engineering at Yale. Therefore, they decided to get rid of it. We became the one university council report ever released to be viewed by the department chairs concerned, to show them that this was not the case. It was quite fascinating.

21-00:51:21

Rubens: Are you given recompense for this?

21-00:51:24

King: No, just the glory of sitting in the corporation conference room for a day, three days a year.

21-00:51:32

Rubens: What about your plane fare?

21-00:51:36

King: They paid travel, yeah. It [i. e., my physical sciences and engineering committee] was a delightful committee. I had a lot to do with deciding who would be on it. They balanced it off in some areas. We had Roald Hoffman, a Nobelist from Cornell who's very much a Renaissance man. John Hopcroft of computer science at Cornell. Peter Flawn, who had been president of the University of Texas at Austin and the University of Texas at San Antonio before that. Big-time geologist. A guy from the Institute for Advanced Study. It was quite a group, and quite a set of issues.

21-00:52:18

Redman: You must have been secretly, or not so secretly, thrilled to be on university council at such an exciting time.

21-00:52:27

King: Well, in that I always sort of like problems and complicated issues, for some sick reason. Yeah, it sure presented those. Yale got into that mess because it didn't have an Academic Senate, and it didn't have the consultative abilities that went with that. They just sat fifteen people in



a room and they listened to all kinds of people, said nothing back, and then produced this report. Plop-o, there it was.

21-00:53:29

Rubens:

Why no academic—just that's the history of their governance?

21-00:53:34

King:

First of all, I think the Academic Senate of UC is a unique institution.

21-00:53:37

Rubens:

Certainly the phenomenon of dual governance.

21-00:53:40

King:

Yes. I've not found its parallel, its real parallel, anywhere. Yes, there are senates, but public universities and private universities tend to be different. Private universities are much more top-down. I ran into that another way, which we'll get to on the Keck telescopes. That's joint between UC and Caltech. That brought up big administrative issues because there's huge dollars associated with telescopes. The way they would have to be handled at UC, to make sense by UC's culture and traditions, was totally different from the way they would be handled at Caltech. At Caltech, the president or provost makes a decision, that's it. Not at UC.

Interview 10: July 18, 2011

Audio File 22

22-00:00:00

Redman: At the end of our last interview, you discussed your involvement with the Yale University Council. It actually wasn't on the tape. Can you tell us what years you were involved with that?

22-00:00:24

King: I started that in 1988. It's a five-year term. The review committee goes the entire five years, so it was until 1993.

22-00:00:35

Redman: You had mentioned that the council is made up of twenty alumni. Was this a position that you volunteered for, or were you asked?

22-00:00:41

King: Oh, no. No, they come to you. I don't know what their path of logic was to get to me. Obviously, they want Yale alumni, but I do not know why they picked me. Possibly recommendations from within engineering. Possibly recommendations from some other high-level advisors to Yale, or maybe a member of the corporation. I don't know. But they did come to me. The way this was set up was they asked me to be a member of the university council for five years, and then they asked me to suggest names for those to serve on the committee with me to review physical sciences and engineering. I suggested some names, they gave me some names, and we converged.

22-00:01:35

Redman: Did you feel that you were given free rein to decide, or was there pressure from contingents at Yale to pick certain—

22-00:01:44

King: With regard to the membership? There was some pressure for certain people, but they were good choices. It wasn't problematic.

22-00:01:53

Rubens: All academic?

22-00:01:56

King: Yes, all academic.

22-00:01:59

Redman: Is that a requirement?

22-00:02:04

King: We were reviewing physical sciences and engineering, and I think, from the science standpoint, it would be unusual to have somebody

from, say, industry or government. The question of somebody from one of those other sectors just didn't come up.

22-00:02:25

Redman:

You had said something last time that I wanted to clarify. You had said that your field was physical science and engineering, and then you said, by contrast, there were three members and three five-year studies on social sciences, one on the Yale Daily News and so forth. Then you said it just shows again where engineering is at Yale. I'm not sure exactly what you meant by that. Could you elaborate?

22-00:02:49

King:

Well, twenty people, each chairing five-year studies. I do remember there was one for the Yale Daily News, which isn't even an academic subject, and I do remember that there were three different ones in social sciences. The social sciences were divided among those three. The point is that engineering, or even the sum of engineering and physical science, isn't that large a chunk of Yale. There has been an ambivalence at Yale, as there has been at Harvard, over the years, as to whether engineering should be part of a liberal university. That's well settled now at both institutions. They are both bringing back engineering rather firmly.

22-00:03:41

Redman:

I understand that, as you're nearing the end of this report, it was announced that Yale did want to get rid of the engineering department. Did you feel any pressure in beginning your evaluation that you were supposed to be going in that direction?

22-00:03:59

King:

Oh, no, not at all, nor did we recommend that direction. This is an interesting story, and we may have done some of this before, but just to get it all together. The university council, in its committees and its reports, are advisory to the president of Yale. The convention is the president doesn't share them. I believe the president doesn't even share them all with the provost, or didn't do so uniformly in those days. That's very different from what would have been the case at a university like ours here in Berkeley, where of course the Academic Senate would have been a recipient of such a report and would have given advice relating to it and so forth. So that's sharply different. No, there was no pressure. Remember, we were not looking just at engineering. We were also looking at chemistry and physics and astronomy, and computer science, which was separate from engineering at Yale. We did a report that related to all of these. We recommended increasing the size of engineering by something like 50 percent as being desirable, and also had recommendations relating to drawing more students, having more and better graduate students, how this might all be organized.

Another very large issue was that engineering at that time was just four departments, I think it was, within Yale College. They were just departments, like English and history and chemistry and what have you. There was, therefore, no dean of engineering. There was a council of engineering that would have a chair, drawn from within the faculty, but it had no administrative role. One thing we wrestled with considerably was did we want to urge that engineering, once again, be separate, a separate college or a separate school with a dean, or did we not. As we talked around, both within engineering and within the administration at Yale, we came to the conclusion that it was just not achievable to get them to cut engineering out of Yale College into something else, nor was that pedagogically desirable. We then conceived ways in which they might have a dean but not a separate school or college, and what that dean might do. That was all in the report.

The thing that happened contemporaneously with the last two years of our report was an effort sparked by Benno Schmidt, who was the president of Yale at the time, to downsize Yale. Downsize it in number of faculty, by about 15 percent, and that then would provide and release the money that could be used to repair the physical plant, all of which had been built at about the same time, around 1930, and all of which was aging, all together. The result of that process, which I think I described last time, was a recommendation of how to downsize. It did include the elimination of engineering, sociology, and linguistics. It included reductions in faculty size of some other departments, and no reductions of faculty size in yet other departments. That is what touched things off. I think I may also have described last time that all kinds of rumors went around in engineering that we had in fact either recommended the abolition, or had recommended that the job of bringing back engineering was just too expensive, and had painted a picture where, in order to have engineering, they'd have to spend more money than they had. That controversy was resolved by an agreement with the president of Yale, that a report would actually be read by the four engineering department chairs. It's the only university council report that I know of where that's happened. I think people were more forgiving once they'd read the report.

22-00:08:35

Rubens:

You urged this specifically to quell rumors and suspicions?

22-00:08:41

King:

Yes. We were asked if that might be done so that they would have a way of trying to calm the waters within engineering. I might add that they did rather well follow our recommendations eventually, and so there was a dean appointed. Interestingly, it was a physicist, but a very enlightened physicist by the name of Allan Bromley. Allan Bromley

had been science advisor to George H.W. Bush. Anyhow, he had been science advisor, and has even written a book on science advising. He, even though he was a particle accelerator physicist, was asked to become dean of engineering, and did so, and took very personal and responsible charge of the initial steps of bringing engineering back.

22-00:09:44

Redman:

Were the engineering faculty accepting of bringing in a physicist to be their dean?

22-00:09:51

King:

They were accepting of having a dean. They wanted that.

22-00:09:56

Redman:

I'm especially interested in this process of releasing the report. How quickly and readily did that happen?

22-00:10:08

King:

Oh, I don't recall the timing well. I know that our recommendations had become known probably in late '92, as we had put them in, even though we still had some time left. I do also know that the last two meetings of university council that I attended were meetings where the new president was in office, Rick Levin. There was also a meeting where there was an interim president, Howard Lamar, a professor of English. The university downsizing report must have come out about a year before the end of our five-year term. The concern, then, was after the downsizing recommendations had come about. This all happened within that last year. The whole thing ends as of June 30, 1993, which was the end of my five-year term and the five-year term of our committee.

22-00:11:16

Rubens:

How often did you meet?

22-00:11:20

King:

The university council met twice a year with the president of Yale. That was the university council as a group. Our committee to review physical science and engineering must have met something like four times a year. There were a lot of meetings, and it was a matter of everybody going to New Haven. We were from all over. I've forgotten whether I named the composition of this last time. Roald Hoffman, Peter Flawn, Robert Langlands from the Institute of Advanced Studies, John Hopcroft from Cornell. People of high activity were on that committee. Oh, and Millie Dresselhaus. I'd forgotten. Mildred Dresselhaus, a very well known professor of mechanical engineering at MIT, was also on it.

22-00:12:20

Redman:

To go back a bit to the release of the report, you had no doubt gotten to know a number of the engineering faculty quite well. What was your personal reaction to basically being accused of the committee that you were chairing calling for the abolishment of the department?

22-00:12:41

King:

By that time, I had done enough administration not to be surprised by anything that might happen. There's nothing too surprising about this that would happen, in hindsight.

22-00:12:55

Rubens:

Did the president give you a heads-up that this was coming?

22-00:13:00

King:

The downsizing recommendation? We knew that the committee was in operation. We knew nothing about what they were going to recommend. I think I described it last time. That committee took a lot of testimony from people as received input. Said nothing back until it put out the report, and that included saying nothing back to us. Nor did the president say anything to us. We did not know what was coming until it happened.

22-00:13:27

Redman:

Could you describe a bit your methodology for going about this? Did you interview faculty? Did you sit in on classes? How did you learn enough to make recommendations?

22-00:13:39

King:

We did a lot of talking with department chairs and faculty. Some talking with students, some talking with alumni. There were plenty of concerned engineering alumni. Yale, remarkably, considering all the troubles that engineering has had there, has a remarkably good set of alumni in engineering, many of whom have reached quite high positions. Just as one example, Roberto Goizueta, who, for something like ten or fifteen years, was the CEO of Coca Cola, is a Yale alumnus. Some other CEOs. There was a person who was a star basketball player in my day as a student, John Lee, who became CEO of some corporations, and became both a great friend of engineering at Yale and a donor.

22-00:14:44

Redman:

We've talked at some length about Yale's tenuous relationship with engineering. In your work on the university council, how did you see this attitude pervading the engineering community?

22-00:15:05

King:

Let me make sure I understand the question. I can talk about what evidence there is of the tenuous situation at Yale for engineering, and I can talk about how the members of the Yale engineering community

may have felt as a result of all of this going on. Which of those, or both of those?

22-00:15:26

Redman:

How about both?

22-00:15:27

King:

Both. Well, I think the things that evidenced the uncertainty are that it had been verbalized in many discussions, in many announcements, and many things written over the years that Yale was unsure what to do with this very practical discipline. After I was a student, but not long after I was a student, a well-known president of Yale, Whitney Griswold, had made the decision to do away with the school of engineering, and then to convert what remained of engineering into four departments within Yale College. One of those four departments isn't really engineering. It was something called applied physics. Yale had, if you will, theoretical physics and applied physics as two different departments for a number of years, and still does, although they're called physics and applied physics. But then just the three engineering departments, which were electrical, chemical, and mechanical. The faculty, I think, started feeling more second-class citizens of Yale. They would see that Yale was doing things in the general undergraduate admissions process that was not encouraging of engineers. A huge, a huge issue while we were doing this review was the fact that there might be one or two chemical engineers, for example, in the graduating class of a particular year. This, for an undergraduate class size of a thousand for all the undergraduate enrollees, so a thousand seniors, a thousand juniors. That's very, very small. I think they felt problems of critical mass. They felt problems of not having good space. They felt problems of having an insufficient operating budget. Well, they might have a problem on budget if they have just one or two students a year to justify it. Those were some of the symptoms.

There is a good side to this, too, because I think Yale, now, and, in a sense, all along, has come up with a good way of combining a broad liberal education and engineering so that, once that change to Yale College took place, a person does not go through with hardly any breadth beyond engineering. From the administration, the question would simply be asked: why does engineering belong in a liberal university? They'd see how we answered.

22-00:18:30

Redman:

Probably not a bad exercise anyway.

22-00:18:34

Rubens:

Do we have the answer to that now? I know you wanted to discuss that later -the case that was made about specifically why it belonged within a liberal arts education.

22-00:18:46

King:

I'd like to hold that until my time at the Center for Studies in Higher Education, where I've been working on that more. Although I did start writing on that subject about 1985, as I recall. I remember an editorial in one of the chemical engineering publications that I wrote, entitled "Chemical Engineers Should Build Bridges." The pitch of the bridges was bridges to other disciplines. Not the Golden Gate Bridge.

22-00:19:21

Redman:

They should not have built the Golden Gate Bridge. [laughter] Just a quick point. You had mentioned that one of your recommendations that was taken up was to have a dean of engineering, but you'd also said that this was problematic because that's not the structure of the university. Can you explain how that worked within the overall structure of the university?

22-00:19:47

King:

First of all, for the undergraduate program is where the ambiguity lies. There's no ambiguity at the post-graduate level. That dean of engineering had the departments of engineering reporting to him, or now her, it is. The graduate program is run much like the graduate program would be run here. It's at the undergraduate level and the requirements of Yale College, so the dean, for purposes of Yale College requirements, is probably an associate dean of Yale College that oversees those things with the students. Still, there are administrative things, like where is your space, what classrooms are available to you, what organizations that require some budget might you set up for your undergraduate students. Those things would come through the dean of engineering. What would not go through the dean of engineering would be the particulars of how to get a Yale College degree.

22-00:21:02

Redman:

Was it problematic to sort of create this new position so that engineering had a dean?

22-00:21:12

King:

Well, they did it, and it was in the form that we recommended it. The sequence of events is this. Our study took place for the five-year period I mentioned. Rick Levin had then become the president of Yale. Before they went and appointed a dean of engineering, they did appoint yet another ad hoc committee, not a committee of university council, to look at our report and advise them on our report. I know the person who was either a member or possibly chair of it—he's a very



good friend—James Wei, Jimmy Wei, who is a prominent chemical engineer at Princeton and has been dean of engineering at Princeton. They had a committee that included or was chaired by the Princeton dean of engineering look this over before they did it. Then they decided to do it, and have done it. Harvard has done the same thing. It's interesting that I have known rather well all of the deans involved in this, since it was done at both Yale and Harvard. The original one was Allan Bromley, who I did not know beforehand at Yale, but got to know because I came back and talked with him a few times. Then Paul Fleury from Sandia, who had been on our president's council for the National Labs, was dean for a number of years. Kyle Vanderlick, who is a still relatively young chemical engineer who had been a faculty member at Princeton, is now the dean. First woman dean of engineering at Yale. Harvard first had Venky—Professor Venkataramamurthy from Santa Barbara, who had been dean of engineering at Santa Barbara. He went to Harvard to be their first dean of engineering in the new era. Cherry Murray, who was deputy director of Livermore, is the current dean at Harvard. That's just an accident of fate. It's the way it happened.

22-00:23:28

Redman:

Sorry, I'm still not totally clear about this. Who did this new dean report to?

22-00:23:38

King:

The provost.

22-00:23:40

Redman:

So that is traditional.

22-00:23:42

King:

Yes. It was a parallel reporting structure to the dean of Yale College. There's also a dean of Yale College—Harvard and Yale—those are very strong figures, too. This dean had a parallel reporting structure, and I believe this is true at Harvard, too, that the engineering dean goes into the provost.

22-00:24:03

Redman:

So there's an engineering dean, and then would there be a dean of arts and sciences?

22-00:24:10

King:

There's a dean of Yale College.

22-00:24:12

Redman:

And that's it, okay.

22-00:24:13

King:

That's it, yes. The other things that have deans at Yale are the professional schools. They are outside this core academic structure, to

the extent that some of the faculty may not have the title of professor, or assistant or associate professor. They have many professional schools: drama, law, management. Seven or eight more. Divinity.

22-00:24:49

Redman:

I understand the argument that apparently won out among the members of the university council, that by appointing this dean it would bring a bit more power to—

22-00:25:05

King:

And focus and attention to engineering and its needs.

22-00:25:09

Redman:

But I'm sure that there was certainly a discussion about whether this would further alienate engineering by giving them a dean separate than the dean of the college.

22-00:25:21

King:

I think the discussion that probably would have occurred, and I do not know that it did occur, but probably would occur, is whether you want to give engineering even that degree of separateness from Yale College.

22-00:25:36

Redman:

Right. But it was determined that the pros of having a dean outweighed—

22-00:25:45

King:

There are many things a dean can do. A dean has a role in the faculty recruitment and appointment processes. There isn't a budget committee at Yale. That dean then has the prime responsibility for the new faculty and for decisions that are made with regard to faculty retention, the decisions that are made with regard to tenure, et cetera. That's one big reason—to try to get a common design on the quality standards, the composition of engineering.

22-00:26:24

Redman:

You had mentioned that Yale—I think your words were “got into that mess,” in part because it didn't have an Academic Senate. If I understand correctly, you're talking about the fact that the university made a sort of top-down decision that would directly impact or abolish engineering without consulting any sort of university group. Is that the case?

22-00:26:50

King:

That's how the decision occurred, as best I understand it. There was a committee that was getting all the input, and that committee was probably twelve people, something like that. I'm not sure of the size. It was chaired by the provost, Frank Turner. It received the input. I think the dean of Yale College was probably a member of that group. If not,

the dean of Yale College was certainly in on the discussions of what to do, and of course the president was in on the discussions of what to do. It was a matter of receiving information, shaking it down within that committee, coming up probably with draft recommendations from the committee, passing it through the rest of the high administration, making sure they would agree on the draft, and putting it out. I believe that is what happened.

22-00:27:47

Redman:

Can you compare, I guess to discuss this hypothetical, the governing system at Yale, in terms of that administration, with the UC? You couldn't have such a top-down decision happening here.

22-00:28:04

King:

That is correct. There would have been immense senate involvement. Even if the idea had started with the administration, there would still have been huge senate process and deliberation here.

22-00:28:19

Redman:

What are the advantages and disadvantages of both?

22-00:28:24

King:

Oh, boy! This actually is a chapter out of the course we taught last week. The problem is how to condense it down to a few minutes from sixty. Given the very delineated and accepted role that the Academic Senate has here, anything of import has had senate discussion and process. There are some things where the senate has the primary role, even, here, and that includes curriculum, degrees, and, really, for all intents and purposes, the recruitment and advancement of faculty. Whatever it is, budget or anything else, the senate has had involvement, discussion, and process. The place accepts that role of the senate. It is also accepted that the administration can do something different from what the advice of the senate is. Just don't do it very often, and not egregiously at all often. There is a faculty buy-in to the process by which decisions come here, and that's what didn't happen at Yale in the example we discussed. There's a clear difference.

Now, what are the advantages in the other direction? The Academic Senate method of governance can be very slow. It can be encumbering if you need to move fast on something. We have worked out ways to deal with that. If somebody gets a recruitment offer from Harvard, we can move quite fast here in developing a counter offer, but a lot has got to happen in that short time. The administration can move faster [without a Senate], and the administration can do what it wants to do without the encumbrance of this faculty advice. Maybe I'm too conservative, but I actually think the need to work with the faculty advice is a good thing, because it can trim some of the too-wild-to-work ideas off of what the administration might do. I'm a believer in

the process we have, and of course, in a sense, I've spent a career trying to oil that process and speed it and make it work just right, so of course I believe in it. It is quite a difference. When we come to the Keck telescopes and the governance of them—that's UC and Caltech, and Caltech is another one like Yale, that's very top-down without any semblance of a senate. Those differences were quite apparent on telescope matters, too.

22-00:31:43

Redman:

You've probably just answered this, but you have had a very productive career in administration. Do you think that you could have achieved the same level of success at a place that functions so differently, at a place like Yale, or I guess at a place like Caltech?

22-00:32:05

King:

Well, one never knows without having tried it or done it, so I can only speculate. I think probably so. I'm of a nature to find a system, work with the system, and try to make it work as best I can. I have tried to have an administrative style that is seeking what will help people so that they will feel that administrative is of use to them and good for them, rather than in their face or in their way. I think that could work within a Yale structure, too.

22-00:32:44

Rubens:

It sounds like at Yale, there's less opportunity to get into at least going up the ranks of the administrative experience.

22-00:32:54

King:

Well, that's true. That's true. I should also point out something else that's quite interesting. Yale has produced a remarkable number of presidents of major universities recently. Other universities. Alison Richard, who was provost of Yale, went to Cambridge. [She] Is the vice chancellor, which means president of Cambridge. Judy Rodin, who was provost for a couple of years during my university council study, became president of Penn. Susan Hockfield, who is president of MIT today, is a former dean of the graduate school at Yale. Yale has produced a remarkable array of administrators.

22-00:33:43

Rubens:

Particularly women it sounds like.

22-00:33:44

King:

Yes. Yes.

22-00:33:50

Redman:

Can you speculate on that at all, or is it just a fact?

22-00:33:56

King:

I think the evidence says that whatever process is at play at Yale for picking high administrators is a pretty good process.

22-00:34:09

Redman:

Did you have anything else?

22-00:34:12

Rubens:

Who literally wrote the report that you submitted?

22-00:34:15

King:

We. By that, I mean I asked each of the members of the committee to draft certain sections. I drafted other sections. Then we went through rounds of my trying to turn it into a uniform style. As a full report, it went back and forth among us. We wrote it. We were not given somebody to write it for us. We were given a guy out of the president's office, who was sort of a second-level personal staff member of the president, to make arrangements and things for us. If we needed appointments with somebody, or the hotel room when we came to work, or a room to work in, he would arrange that.

22-00:35:02

Rubens:

Forgive me if I'm dense about this. You're involved with a five-year review, at the end of which a report comes out. It's in the meantime that the president puts together another council or review that's looking at the whole system?

22-00:35:20

King:

Yes. That was not part of university council, his review.

22-00:35:27

Rubens:

To me, it sounds like an undercut.

22-00:35:30

King:

Well, but remember that university council has been there for a very long time. There are new members every year, and therefore new five-year studies every year, and engineering was done now, and probably another study of engineering has been done by today. It's regular reviews through university council.

22-00:35:55

Rubens:

Does UC have the same—

22-00:35:58

King:

We have no equivalent of university council. We do have what used to be called five-year reviews of departments and organized research units. Now eight years—a more descriptive term. They involve both people from within the campus and outsiders.

22-00:36:23

Redman:

We'll return to Yale, at least in theme, when we talk about how engineering fits into liberal arts education, but that will be for a later time. We had talked a little bit, before we rolled the tape, about your scientific work in California, but I would, if it's okay, sort of like to

keep that as its own unit. We're bouncing around a bit, chronologically. You started off, if I understand, in 1984. You're on the California governor's taskforce on toxic waste and technology. How did you come to be involved with this?

22-00:37:10

King:

The simple answer to your question is I got asked by Ted Hullar. How did the whole study come to be? Governor Deukmejian felt this was an important area, and he wanted to commission the scientific establishment of California to study that area and to make recommendations on it. It was politically contentious. It was in the legislature in between the parties. He wanted sound advice. I think his original design is not unlike what the National Research Council does on the national level. You want a non-political, dispassionate review of everything. However, the way this was done was interesting. Ted Hullar was, at that time, the chancellor of the Riverside campus. He was later chancellor at Davis. Ted, I think, was given free rein to set up his own committee. Well, to set up his own advisory committee, because the way this worked, there was a master board that was not at all homogenous politically. It ranged from the executive director of the Sierra Club, on the highly environmental side, to the president of the California Chamber of Commerce on the other side, business side, and lots in between, and even some sitting members of the legislature, as I recall. Then the way it was designed, there would be these four or five working groups under the taskforce that would bring forward the facts for consideration by—I've got to get my terminology right—let's call the top one the council, and the working groups, we'll call them technical advisory committees. The committees, being set up non-political, would bring analyses up to the council, which would then consider them.

22-00:39:19

Redman:

I'm so sorry to break in, but this is the California Council on Science and Technology?

22-00:39:24

King:

No. I am talking here about the Governor's taskforce on toxic waste and technology, not the California Council on Science and Technology.

So the top one will now be the taskforce, and working groups will feed into it. Okay, so now back to the beginning. The taskforce was composed of people with strong views from all parts of the political spectrum. Feeding into this were either four or five working groups, which were chaired by people who were not aligned with some political cause, and which would advise with regard to what was possible in various lines. I ended up chairing one of these working groups jointly with Jim Boyd. Jim Boyd was, at that time, the

executive director of the Air Resources Board, which is a state government body. [He] Subsequently went on to the Energy Commission, by the way. We were to examine, I think it was, available technology and how well it would work. The way this body worked is interesting, and what happened to its report is interesting. The way it worked is that our working group, people on it worked together quite well, even though we were from varied backgrounds, and came up with factual recommendations. The chairs of these [working groups] would then appear before the governor's taskforce, in its entirety, and would be asked questions. In hindsight, this was rather good preparation for being a system-wide provost and going to regents meetings, because you've got people from every political point of view bombarding you with questions. Their questions are both to get information from you and to get in a jab at the other political side of the taskforce. They were, in effect, talking to one another in rather unfriendly political terms through these people they were questioning. As I say, this is not unlike a regents meeting when you've got a board that's split between two parties. That was my first exposure to such a thing. It was interesting to try to figure out what to do and how to walk the fence and stay atop the fence and go in the right direction on the fence as you're making your presentation to these people.

22-00:42:21

Redman:

Would this be in Sacramento, these meetings?

22-00:42:24

King:

Yes, I think it was. They may have met some other places, but most of it was Sacramento. Our meetings [of the working groups] were at other places. I hosted some at the Berkeley College of Chemistry.

22-00:42:35

Rubens:

How big, about, was the working group?

22-00:42:40

King:

The working group, the little one? Probably six of us. The main taskforce was probably more like fifteen. So we did eventually have a report from all of this. I'm going to have to do some research at this point. I'm trying to remember how Art Torres got into this. He was eventually chair of the California Democratic Party, but he was a legislator at that time. He was, I believe, a member of the taskforce. Possibly the vice chair, or one of two or three vice chairs. In any event, by the time we had conceived this report and the time came to have an unveiling of it, Torres, who objected to the results, held a press conference two hours before the press conference at which the report was going to be released, made some very strong statements that were good copy for the papers, and that's what got the headlines, rather than the recommendations of the taskforce, which, again, was the first time I had so personally run into something like this. That's not uncommon

in this world, mind you, one finds out after a while, but that was my first introduction to such a thing. In effect, what amounted to a year's work and a lot of effort came to naught. I'm trying to remember the order of governors of California. Deukmejian was '82 to '86, one term. So Pete Wilson's next?

22-00:44:43

Rubens:

I think so, and then Davis.

22-00:44:45

King:

Yes, okay. That particular initiative was not continued by the Wilson administration.

22-00:44:55

Rubens:

I just want to clear how Hullar got you into this. Was he an advisor?

22-00:45:02

King:

I had not known Ted before. I now know Ted very well. I had not known him before, and he just called me up out of the blue. I think the fact that here was a chemical engineer—he had probably found me through a technical grapevine, because work on separation processes relates very strongly to both energy and the environment. My guess would be that he came through the hierarchy of UC in some way to find me, and whether it was through Heyman and Park, or whether it was through what would have been Bill Frazer or David Gardner, I don't know.

22-00:45:53

Rubens:

Hullar was asked, though, by the—to set up the—

22-00:45:59

King:

He had been asked by the governor, or the governor's people, to set this thing up.

22-00:46:05

Redman:

What did Art Torres find so offensive about the report?

22-00:46:09

King:

I'm trying to remember. I don't remember. I could poke in the files and see if I've got something. The question is whether I've got that file, and I may not. It may be in the files of the dean of the college of chemistry.

22-00:46:31

Redman:

I'm curious about the larger taskforce. Were the goals mainly to consider environmental public health type of issues?

22-00:46:43

King:

Yes. It was what should be general policies with regard to releases to the environment, and what could be done that might be innovative and



particular to California. I remember that we did bring into discussion a couple of things down in the Barstow area that were new at that time. One was the Texaco project that had been under Warren Schlinger, (who became a good friend of mine after this) that dealt with coal liquefaction. Another was the Solar One, I think it's called, out near Barstow, that was the first large plant to have lots and lots of mirrors capturing the sun's rays, and then turning, throughout the day, so as to continually focus them on a sphere, up on a pole up in the air. The sphere would get very hot, and a fluid would run through the sphere and become heated in there. It was a source of energy.

22-00:48:00

Redman:

You were given these broad strokes. You were to look at technology and how it deals with all sorts of toxins and wastes.

22-00:48:11

King:

Things that could be useful to bring in to do good things for the environment and California, and as well things that could be employment or California-based industries.

22-00:48:25

Redman:

On your working group, were there representatives from industry, or was this—

22-00:48:32

King:

I think so, yes. I'm going to have to check my file again to recover who those were. There was Jim Boyd and Scott Lynn who was in Chemical Engineering at Berkeley.

22-00:48:42

Redman:

You had said that these working groups were not along political lines. Did you find that it was apolitical?

22-00:48:52

King:

This is a bunch of engineers, doing engineer things.

22-00:48:57

Redman:

It was apolitical, then.

22-00:48:58

King:

Yes.

22-00:49:01

Redman:

You very well might not know, but were the other working groups also apolitical?

22-00:49:07

King:

Yeah, although some got closer to where you just couldn't get out of the political waters, like policy working group, that sort of thing. What

might be good policies to put into effect in the state. But yes, that was the aim in the design of it, was to have these different interests meet.

22-00:49:23

Redman:

What were some of the other working groups?

22-00:49:25

King:

There were academics, high ranking people from the state senate and assembly and a range of policy and political people. [see [http://articles.latimes.com/1985-11-24/news/mn-1678\\_1\\_task-force](http://articles.latimes.com/1985-11-24/news/mn-1678_1_task-force)]

22-00:49:30

Redman:

Just to have this on the record, you were chair of the Technical Advisory Committee on Technological Considerations? Does that sound correct?

22-00:49:41

King:

That's it. So scratch all working groups and make them technical advisory committees.

22-00:49:51

Redman:

To further complicate things, now I do want to talk about councils. This is more recently, but you were on the California Council on Science and Technology. I think chair from 2002 to 2004. So we'll jump ahead in time, yes, but keep geography. That's our theme here, I suppose.

22-00:50:31

King:

It's going to give us a little trouble, you'll find out, because I get into that one because of Walter Massey, and Walter Massey is the system-wide provost when I go down there to be vice provost for research.

22-00:50:47

Redman:

Let's skirt it for a moment. Can you just tell us a bit about the group? I think it was founded in 1988.

22-00:50:54

King:

Sounds right. It's very interesting. It was created by two California legislators, by their drive. One was Sam Farr, who later went into the U.S. Congress. He was from the Monterey area. I believe the other is John Vasconcellos, who had a long career in the California legislature. It is created by act of the legislature that there shall be such a body. That gives it status. It gave it no funding or any other accoutrements of government, and it actually is a body to advise the government. It's not part of the government. Employees are not paid with state money. It is instead a 501(c)(3). Its role was sort of up in the air for the five years or so of its existence, up to the point where I became involved with it. It had done two things up until then. It had tried to advise the state of California on whatever the state of California might want advice on. That had sort of jumped around as to what those functions would be.

There hadn't been much consistency to that. The other thing it had tried to do was to create and run its own major project for the state, which was, I believe, Project California. It ended in 1995. [see <http://ccst.us/publications/1995/1995California.php>.]

When I got involved with it, it was because I had gone down to the office of the president, and because Walter Massey, who was provost and senior vice president for academic affairs of the system, was the chair of this. He wanted help, and so without membership or anything, he brought me along to meetings, just to be there, to listen, to think with him, to advise him, and talk with him back at the office of the president when we got back from the meetings.

22-00:53:36

Redman:

This is for developing the electric car project, or for—

22-00:53:39

King:

No. He was chair of the California Council on Science and Technology. I should explain its structure. It is an organization that was founded originally by six universities within the state: UC, CSU, the community colleges, Stanford, USC, and Caltech. The core budget comes from those universities, with UC paying three times as much as each of the other five do, because we're bigger. It has a board which has representatives from each of the founding members and a few industrial members, and it functions like a board of directors. It's not operational. It just handles governance issues. That Board, for a very long time, and still, is chaired by Karl Pister, who was dean of engineering here, and subsequently chancellor at Santa Cruz and the vice president system-wide.

22-00:54:54

Rubens:

After Massey, he's chairing here?

22-00:54:57

King:

No, the board was and is chaired by Karl Pister. The board appoints a council. The council is the operating arm of this [organization]. The council can be as many as thirty people, drawn from all sectors throughout the state, except it wouldn't have a sitting member of the state government. It would have people from universities. It would have people from industry. It would have people from government labs, Livermore, Jet Propulsion Lab, et cetera. It was as I got involved with it, with Walter Massey, that this issue came to a head of what should really be the definition of the mission operationally. We did decide that what should be done primarily is to emulate the National Research Council at the federal level, only do it for the state. We would work on advising the state and doing studies for the state on what we were asked by somebody in the state's government to do. We would not volunteer studies to the state. We would take funding from

state agencies. We would take funding from foundations or any other source to do particular studies.

Now, in contrast to the National Research Council, we would be different in two ways. One is that we would have a very, very small staff. The staff of CCST is probably four people. The staff of the National Research Council is probably 400 people. A great difference there. The second large difference is that, whereas the National Research Council, as a matter of policy, has no involvement with an agency that requests a study, after the NRC has accepted the study and before the report, in reviewed form, is released, from that beginning to that end, there is no contact with the agency. That's a matter of policy for the National Research Council. We put all that by the boards and had continual contact with whoever were the appropriate people within the agency. We felt that was important to stay plugged into the problem in California and not get lost out somewhere in a dream world doing a study.

#### Audio File 23

23-00:00:02

Redman:

We have been talking about the California Council on Science and Technology. One of my questions is what types of projects did you work on while you were involved?

23-00:00:37

King:

My involvement, it was for a good, long time. I actually was made a member of the council a year or so after my year of appearing there with Walter Massey, and then went through two terms as council member, and then was asked to chair the council, which was a third term. That's a ten-year tenure working with that council all in all. So a lot of change, you heard, during those tenyears. I believe we were discussing the question of its mission and its selection of a mission that was like unto, but different in important ways, from the National Research Council. That mission had been selected at a point in time where the executive director position, which is the senior fulltime paid staff position for the council—at a time when that position had become vacant. There was a search that Walter ran, which came up with Susan Hackwood from the Riverside campus of UC as the executive director. Susan had worked for Bell Labs, had been at Santa Barbara for a while, UC Santa Barbara, and then had been at Riverside and had been dean of engineering for a while. She was interested in this government-oriented work, and so she was taken on. That's got to be about 1995 that she came on, and she's still there and has done a very nice job. Susan's strategy, and it was the right one, was to take what projects you can get from the state government that really want you to do.

I remember one of the very early studies that I was involved in was one to assess the approval process for digital media for the public schools. We have a textbook adoption process in the state of California. The question was what should be the parallel for digital media, and so we came up with such a thing, trying to avoid the great inertia and overwhelming import of the textbook adoption process. [The] Textbook adoption process is a two-ton gorilla. If you can get your textbook adopted, you've got a huge number of sales in California, and it's captive and it has to be uniform throughout the state. We were trying to avoid such huge financial incentives being associated with the digital media.

23-00:03:32  
Redman:

How did you avoid that?

23-00:03:35  
King:

By giving more flexibility in the use of digital media. We got away from the concept of the same thing having to be used in every school. That went rather well. We then had a study of the science and technology infrastructure of California, and what makes things work well, what makes things work not so well, and what the needs were. That one came out with a result that pointed towards the school system, and the linkage between the school system and higher education, as being the weak points in the system of supporting science and technology-based industry in California. That was another one. We have been through reviews of the state Energy Commission. They asked for that. How well they're doing their job, how might they do the job better. The council has done two or three of those. From the infrastructure study, the council went on and then did a study of science and technology teachers for the schools and how to try to create more of them.

As further examples, I can think of one where we sort of took the bull by the horns ourselves, which was the point in time where Governor Schwarzenegger had just come into office. An initiative of his was the so-called hydrogen highway. That came from one of his cabinet members, and he had taken it up as an initiative. He had defined it in a way where, you build [hydrogen] filling stations and they will come. The filling stations were to be distributed around the major highways, such as the interstates, in the state. Yet the problems of hydrogen vehicles are such that their initial use is going to be quite localized within cities rather than going long distances throughout the state, because there's a problem with [the] weight and quantity of hydrogen that can be stored. Of course, other issues related to that matter are that you've got to have the cars as well as the filling stations, because you don't take an existing car and convert it to a hydrogen car. That's very much a special make, much more so than the hybrids or straight

electric cars that are running around now. So there's that. There's also the matter of developing the means of liquefying hydrogen inexpensively, because that's how you store it, and then storing it, and how would you store it and where. By the time you get to the end of this story, there are five or six huge things, all of which have to mature at about the same rate. You can't just start putting one in place and get the rest used. So we did take it upon ourselves to go to Sacramento and make that point to the people most concerned with the initiative. I think that had something to do with that initiative stopping soon thereafter.

Those are the sorts of things we've done. Nearly always, it's by invitation, but there's some that have not been. It does put pressure on the study team members. With a staff of just three or four, and these reports to be written, it makes for things working in a different way from the National Research Council level. If you're on a National Research Council study, you've got a very good and fairly specialized senior staff member who will sit with the study all the way and write the draft of the report. Can't do that with CCST, so there's much more involvement of the council members themselves, or the committee members, for a study on something or other. On the other hand, I believe it [i. e., CCST] has come a very long way, and it is now in a situation where it receives substantially more requests from the state government to do high-powered and important things than it can do. That's success.

23-00:08:08

Rubens:

How much time did you spend? It must have varied.

23-00:08:14

King:

During much of my tenure on the council before I became chair, I was also a provost. It probably didn't get more than about two hours per three weeks, something like that, as an amount of my time. When I became chair, for that period, I was, for most of it, still a provost, but then it did go a little past the end of my provostship. That took substantially more effort. I would have weekly phone calls of an hour or two hours with Susan Hackwood on how things were going, and I would be involved in one study or another, and I would make trips to Sacramento with her and one or two others if there was somebody we needed to talk with. That was significantly more. It would have been a more effective use of my time, and I probably could have done even better by the position, if my chairmanship had been after I was UC provost. But things worked out as they did.

23-00:09:26

Rubens:

What did you particularly like about it, and what did you get out of it?

23-00:09:32

King:

I found it quite fulfilling, because the state of California really has no systematic source of scientific input or advice. There are no science committees for the two houses of the legislature. There is no science advisor to the state. We have recommended one; CCST has recommended one. It hasn't happened that they put in that structure. There is no science advisor. It is only rather specialized agencies that have the scientific know-how within the state government. That would be the Department of Transportation, the Energy Commission, the Board of Air Resources, that sort of thing. It was fulfilling to be able to put some of this input into the state in ways where it would be useful and listened to and worked with. That's the most satisfying thing, is to actually see that it makes a difference there. It is a way of doing something that's been rather difficult in this world, which is to take people with good scientific know-how and fit them enough into the world of policy and politics so that there's a way in which they can actually have an effect and be part of decisions and screening of alternatives and so forth. That was satisfying.

23-00:10:59

Redman:

Some of the examples that you gave, the hydrogen highway, are clearly California issues. But some of the other examples that you gave, in terms of adoption of digital media and teacher preparation and creating a better link between K through twelve and higher education, are issues that, at that time, were being pretty heavily investigated by places like the AAAS and the NSF. It probably was a comparison of reports in the end. I'm assuming that you probably didn't work hand-in-hand with the AAAS or the NSF, but how were your reports viewed as sort of next to similar reports done at the national level?

23-00:11:52

King:

Let me say something about each of the reports you mentioned, and then about another thing the council did. The two you mentioned, the digital media, that is peculiar to California, because California has its own textbook adoption process. In that they were starting from that as a model, that was a peculiarly California problem. The need for teachers, you're quite correct that that's nationwide. AAAS and many others are heavily involved, and it's quite a vexing problem. But only California has the particular credentialing system that it does, has the particular tripartite higher education system that trains most of the teachers, and has a CTA, a California Teachers Association, which is a major component of the puzzle. There are issues localized to the state within this, and that's a lot of where we were.

That leads me to another thing that the council has done, and that is to work with the National Academies. That's been a very interesting relationship, and that happened during the last couple of years of my chairmanship. The council decided that there were many good

National Research Council reports that might benefit from being California-ized. That is, take a report—let's say on something like teacher training—and now put on top of that, here's what it means for California in our context analysis. So the council started doing some of that, and in that way worked with the academies. Now, the other interesting thing is, at the same point in time, the academies decided that more and more of the action with regard to science and technology was occurring at the level of the states rather than the federal governments, and so our effort through CCST was apparently the most developed such state effort that the National Academies could find within the U.S., so they became interested in us as a model for what could be done in other states, and then actually developed a plan, which has never come to pass, and I don't know why it hasn't come to pass, because it was quite active in my time. The academies developed a plan where their West Coast center, called the Beckman Center, in Irvine, adjacent to the Irvine campus, where CCST might move in to the Beckman Center and use space and be right in there with the National Academies. I have not had involvements since '04 when I left the chairmanship. I've not had enough involvement to know why that didn't come to pass.

23-00:15:11

Redman:

I want to get back to those larger themes, but before we do, in case this is part of it, I'd like to talk about the time that you spent, somewhat oddly, on the California Association for Research in Astronomy.

23-00:15:30

King:

You're well into my provostship now.

23-00:15:34

Rubens:

Just before we do this, I wanted to ask one more question about the CCST. Is there anything that you want to point to during the time you were chair that you initiated or that you feel particularly proud of?

23-00:15:54

King:

I'm proud of what we were able to do on the hydrogen highway, to bring some reality to that. That's one. I was quite proud and pleased by the association with the National Academies, too. I just can't finish that one off to the ultimate punch line, unfortunately.

23-00:16:17

Redman:

This work for Research in Astronomy, you've been talking about the Keck telescope.

23-00:16:22

King:

Yes, the Keck telescopes. What they are is ten-meter telescopes, a pair of them. Ten meter is, at the present time, the largest telescope made. After all, that's ten yards of telescope. That is not your garden variety telescope. These are a joint project of UC and Caltech, going back to



the time of David Gardner's presidency. The idea used in the mirrors of these is an idea that comes from a man named Jerry Nelson, who was at the Lawrence Berkeley Lab at the time of the invention of the idea, and then subsequently went to Santa Cruz campus, where he is still a professor. So it's a UC idea. It enables looking further and better and more sharply at things off there in the heavens. They are located on top of Mauna Kea in Hawaii, with a number of other major telescopes. There's a telescope complex there. They are headquartered in the town of Waimea, Hawaii, which is at about 3,000 feet of elevation, so well up from the coastline, but nowhere near up to the 14,000 feet of Mauna Kea summit.

To continue as other background, which is probably recorded elsewhere, there's a very interesting story associated with how these telescopes came to be and how they were funded. It includes our president of the university, David Gardner, having courted a very wealthy donor who made a verbal commitment for the major gift that was needed, and who passed away the next day. But that's not for me to record. That's for somebody else who knows it better. The agreement was made with Caltech. Caltech eventually went to the Keck Foundation and got the money for the construction of the telescope. The Keck Foundation, like many other foundations at the time, had a policy that they would give money to private universities, but not to public universities, because taxpayers support public universities, and that's supposed to be enough. Therefore, Caltech, after the episode of the dying donor, got the money from the Keck Foundation. The arrangement was made with UC whereby UC would put up—I think it's either twenty or twenty-five years worth of operating funds, which is a use of the 6 percent of the overhead of UC grants that is retained at the office of the president, or that was retained in my time. I can't speak for the present.

That's the telescopes. They serve astronomers from the UC campuses and from Caltech. That relationship between the two institutions has been very interesting in many ways, because Caltech is very small; UC is very large. Caltech is very private; UC is very public. UC has lots and lots of astronomers; Caltech has nowhere near as many astronomers. As we've just discussed, in connection with governance matters, the institutions differ. It being a UC system-wide project, that came in at the office of the president and focused on the provost at the office of the president. Walter Massey had been chair of the California Association for Research in Astronomy while he was provost. I think the end of his term as chair coincided with his departure from Morehouse College, which would have been 1995. The setup between Caltech and UC has been that there is a chair from one, a vice chair from the other, and after a three-year term of that, then the positions switch. Ed Stone, former director of the Jet Propulsion Lab, has always

been the chair of CARA from Caltech when there's been a Caltech chair.

Walter Massey was from UC. Whatever was three years after that, it became an issue for us in the office of the president. It was just when I had hired Robert Shelton as vice provost for research while I was provost. [Who later became President of the University of Arizona and is now President of the Fiesta Bowl.] Robert Shelton was very interested in astronomy and the telescopes, so I let him have this fun for a three-year term. Actually, it was a six-year term: three as vice chair, three as chair. Then when Robert went off to the University of North Carolina as provost, and it was time for a new UC vice chair, I thought, well, why am I letting this fun thing get away from me? Despite knowing no astronomy whatsoever, and that field is full of acronyms and special names and so forth, but knowing nothing about astronomy, I became vice chair for three years, and then chair of the California Association for Research in Astronomy, which is another 501(c)(3), formed by these two organizations [i. e., UC and Caltech]. That board oversees the operation. Ran into all kinds of interesting things.

23-00:22:27

Redman:

Before you get into that, which I certainly want you to, this association, CARA, although it's named the California Association, it's California because UC and Caltech are both located in California?

23-00:22:43

King:

That's right. That it's a corporation formed for one purpose.

23-00:22:49

Redman:

And no state funding?

23-00:22:51

King:

No. Oh, no. There was not originally any federal funding. There subsequently was federal funding, and that may be where you were headed. NASA is part of it, with a one-sixth share which they have put in through relieving some of the operating costs. NASA carried the ball for a subsequent construction project that the Keck telescopes wanted to have. The way this works is the first Keck telescope was the first thing built. Then the idea was nurtured to have a second telescope, and have these two placed a certain distance apart, and to run interferometry, light wave interferometry, between them so as to get some of the attributes of an eighty-meter telescope, which would be from one end of one mirror to the other end of the other mirror. It's technologically extremely complicated, and here it sits up at 14,000 feet.

Here are some of the complications. You have everything associated with that interferometry. You have mirrors moving, and yet the interferometry has to work no matter where the scopes are aimed. The interferometric system is very complex and elaborate. It takes careful alignment. Then the segmented mirror idea, which was the invention of Jerry Nelson that I mentioned, these are hexagonal-shaped plates of glass that get put together sort of as you would if you were making a geodesic dome, even though they're making a telescope mirror that's curved. Each one of these hexagonal plates has got a mechanical system behind it that pushes or pulls on it so as to change the shape and ways in which that segment will receive light. That is done to deal with the turbulence of the atmosphere, which is a distorting factor. You measure the turbulence that's going on in the atmosphere, and you move these little mirror pieces to adjust for that, continually, because the turbulence is always changing. This is really complicated, and it's up there where the air is rare and it's difficult for people to work. There's not a hardware store next door or anything like that. It's very interesting doing such a thing in that location. That's what the telescopes are.

23-00:26:01

Rubens:

Was Ames involved with this?

23-00:26:07

King:

NASA was involved through Washington NASA, not through Ames. Ames Lab, of Mountain View, California, is not involved in it.

23-00:26:19

Redman:

I assume, with NASA's involvement, they also have probably one-sixth of the research time on the—

23-00:26:25

King:

Yes, they get observing time out of it, and they also were going to enhance the interferometry better, in ways that I don't fully understand, by building so-called—they were satellite telescopes that they called outrigger telescopes. A good Hawaiian term. Just as an outrigger canoe has these little things out to either side, so these four outrigger telescopes would surround the two big telescopes at four corners of a rectangle. They would tune in on things and enhance the interferometry. That was the idea. For all of my chairmanship, we wrestled with how to get this going. The wrestling had to do with the approval process in Hawaii. The Keck telescopes have a landlord atop Mauna Kea. That landlord is the University of Hawaii system. Then the University of Hawaii deals with whatever needs and problems there are that involve the government of the state of Hawaii. To get these outriggers permitted, there was a process going on whereby there would have to be hearings attended by the observatory director and some others from the observatory, but also with the University of

Hawaii people. Those hearings then met the fact that the top of Mauna Kea is sacred to native Hawaiian people, having been a burial ground for Hawaiians historically. There was, at the same time, quite a movement going on in the state to try to get political rights and power for the native Hawaiians. The outriggers were a convenient thing to be used to try to establish that role and power, and that's what happened. There was a lot of contention from the native Hawaiian community worked into the legislature and in other ways, and much need to go out and make presentations to deal with that. We finally got to the point where all of the successive steps of the permitting had been done, and that very year the NASA budget tanked and the outriggers were removed from it, never to appear again. So there are no outriggers on the Keck telescopes, but it was certainly an interesting experience, and probably the most challenging and intriguing that I was involved in during my time as chair of that board.

The other thing I got to do was hire an observatory director, which was sort of interesting for a chemical engineer. Our original and longtime observatory director had retired, and so there was a search done with the astronomers manning the search committee and then coming up with the individual who was recommended and approved by the board. I got to go through all the negotiations of landing him for the job. Now, why would that be difficult? Anybody would want to go to Hawaii, right?

23-00:29:42

Rubens:

You went to Hawaii, I assume.

23-00:29:45

King:

Oh, I went to Hawaii many times. To finish this thought, when you are talking with somebody about moving their family, their career, to the state of Hawaii, there are certain very practical issues that come up, like being remote and cut off, and what's the quality of the schools, and can you get my children into the private academy that's the best school, and so forth. We went through all of that. It has been interesting for that telescope. There are some people, just as there is for Los Alamos, it's in a different enough place, and there are people who really just like that as a place to live, and so they want to go there, but there are not all that many of them. For the general people within the profession, it's sort of a pull to get somebody to move over there and put their career there and their schooling and everything. They may have an aged mother in Vermont or whatever. It is a complication.

On my trips there. Jeanne would go with me, at our own expense of course. Yes. We held four board meetings a year: one at UC, one at Caltech, and two in Waimea. There would be a winter and a summer

meeting over in Hawaii. Now, what do you do if you're going to go over to Hawaii to go to a meeting? All the fancy hotels are down on the Kona Coast. I quickly learned that that wasn't my cup of tea, that staying right in Waimea was my cup of tea. We would stay at a place called the Jacaranda Inn that was built by Laurance Rockefeller back in 1930, as Laurance Rockefeller was there to build the Mauna Kea Beach Hotel down at the foot of the road coming down from Waimea. We'd explore every inch of the big island. We had lots of fun doing that. And, of course, for the outdoorsmen, you do have a volcanic national park there, with all sorts of interesting things going on in it.

Before the lawyers of the Park Service got there in force, I remember a time when Jeanne and I drove down to the end of the Chain of Craters Road in the national park, the day after one of these board meetings. There were little orange flags stuck in the lava. You drive to the edge of the lava. The lava flowed over the years and cut off the road, which used to be a continuous road. You park. You follow the orange flags over the lava. You get out there and here was this guy in a Smokey the Bear hat, and a sort of tattered short-sleeved Park Service shirt, and jeans and whatever. You look around. It's orange. It's orange there, it's orange there. My gosh, that's hot lava right there in between the pieces of old lava. The ranger was just having a fine old time, saying, "Oh, look it's coming up over there!" People would run over and look at the flowing molten lava. You scratch your head on this a little bit. Should we really be running over lava that's got this orange, glowing stuff coming up through it? I remember a fine old time of doing that, and then I remember going back a year or two later, and the lawyers had gotten there, so you couldn't even walk out on the lava, and nowhere near the glowing stuff. So we know the national park very well and enjoyed that. Know Hilo very well. It's a delightful city. Marvelous botanical garden just north of Hilo.

23-00:33:40

Rubens:

About how big was the board?

23-00:33:42

King:

The board was three from Caltech, three from UC, six people. UC always provided the financial person, so that was Wayne Kennedy, and then Joe Mullinix from UC. The director of the Lick Observatory [UCO] That was Joe Miller during most of my time, and then he was succeeded by Mike Bolte. Caltech would be Ed Stone, plus the chair of the math and physical sciences division of Caltech. It's like a dean position, but I think it's called chair, and then their equivalent observatory director, the director of Palomar.

23-00:34:36

Redman:

I understand that this was ostensibly an administrative position, but how much astronomy did you have to learn, and how did you do it?

23-00:34:45

King:

I had to learn the lingo enough to recognize what was being talked about. I don't think I became a scientist of astronomy in any way, but I had to get enough feel of what was being talked about, what was being desired, why it was important, et cetera, to steer it through the administrative path. That's just one more example of something that I found very, very interesting throughout my career, which is having a sudden administrative involvement with something I know nothing about and having to figure it out. We'll meet some others of those, including thirteen professional schools and a museum.

23-00:35:26

Redman:

Quite the Renaissance man you've become.

23-00:35:29

King:

Well, it's just fun.

23-00:35:35

Redman:

It sounds like this is distinctly different enough from the two other scientific roles in California that we talked about, but I'd like to sort of talk in broad terms. Do you feel that these efforts that you've been talking about within California to sort of assess and develop and support science are unique to California?

23-00:36:03

King:

The California Council is unique to California, yes. I don't think that governor's taskforce was all that different from any other state, and it was ad hoc. One thing of a kind, not a continuing set of such things. But yes, I think there is a uniqueness to California. I've had lots of visitors in my two provost positions and here at the Center for Studies in Higher Education who come through and want to know, in effect, what makes UC, and then what makes the state of California, tick, relating to these science and technology things. That was also a question back when CCST was doing this first infrastructure study. What makes California tick, and what has been done right in the government? The short and simple answer to that is the government has stayed out of it. It has developed a number of policies that are enabling to entrepreneurs in a venture capital community and startups in the Silicon Valley, but they have not prescribed how it shall be done. It's not a matter of having some state government office that you must clear any entrepreneurial activity through. You just do it. The state government has taken an enabling role, which I think is very good. The California Council, I don't know that it could replicate in any other state, because all state governments are different. There is a book, which I could probably pull off of a shelf in here, which is a survey of the fifty states, as to what they do for organizational support of science and technology. You won't find another one that's like

CCST. I think you sort of have to tune what's done in a state to what the state is, what it's got, what its issues are.

23-00:38:09

Redman:

No doubt, there's an endless list of organizations that look at various components of science and technology and engineering in the state, but are there others, other than CCST, that are worth mentioning?

23-00:38:24

King:

If we take ones that try to cut across all things technological, I think CCST is the only one at the state level. There are support groups for the biotechnology industry, or for Silicon Valley. There's something called Joint Venture Silicon Valley that has tried to address the common needs and interests of Silicon Valley. CCST is the one I know at the state level, and I'm pretty sure also the only one that is commissioned by an actual act of the legislature.

23-00:39:04

Redman:

To go back to that, was that a bipartisan—do you know?

23-00:39:08

King:

I think it was, yes.

23-00:39:14

Redman:

We'll talk at greater length after going through the office of the president about sort of the larger issue of the university-industry relationship, which will probably come back to looking at California as well as elsewhere. I'd like to take the opportunity here to ask whether you think that some of these efforts undertaken here in California any way provide a model of how to forge these relationships between, for instance, these working groups that will bring together people from the academy, people from industry. Does that offer a model to other states, do you think?

23-00:40:07

King:

Is enabling and letting it happen a model? I think it probably is. I'm aware of activities in other states where some sort of state agency or state-created something has been put in place in order to try to foster technological innovations, starting up new companies, bringing in new industry to the state, et cetera. There's one I had an advisory relationship with for a few years, which is the Michigan Biotechnology Institute, which was set up by action of the state to try to promote the biotechnology industry in Michigan through the creation of a major R&D laboratory that was an arm of the state, or certainly funded by the state, in order to make this draw. I don't think that's worked that well. After looking at the California scene and comparing it with these others, I really conclude that it was wise of the state to seek ways to enable and then let nature take its course. That said, I can think of one thing that's been done here in California

through UC that I think is effective. That's the Governor's Institutes on Science and Innovation, so-called, that were an initiative of Gray Davis. QB3 and CITRIS are two of the four such institutes that occurred. That one we should probably wait for until office of the president days.

23-00:41:50

Redman:

I'm also just sort of struck with, in some sense, the mission of the CCST and how you see sort of a similar thing happening in these working groups, where you're bringing together people from all segments to look at a scientific or technological or engineering problem.

23-00:42:23

King:

Or to assess what the state is doing to help science and technology, and that did require people from all sorts of different backgrounds.

23-00:42:31

Redman:

Do you think that that's unique to California? That California is, in some sense, enabling this relationship to happen and is almost sponsoring—

23-00:42:41

King:

Such things fit the California culture work well in California, and I think, on the average, are not quite as easy to do elsewhere as they are in California, and in that sense are a California advantage. That said, I am sure that a systematic survey and study would show that there are some other very effective things that have been set up in other states.

23-00:43:10

Redman:

Lisa asked this in some sense, but I want to elaborate on it. Was this work that you were doing to assess science in California special to you? It somehow strikes me that this is sort of akin to other service work that's been so important to you. This is a way to give back to your state, to your home state. Was that a factor?

23-00:43:39

King:

Sure, that's a factor. I think another is just not seeing many ways in which science and technology directly impinge on the state government. If you read the newspapers, what various legislators or government officials say, what the stories are, it is very commonly felt among scientists and engineers that somehow the understanding and the capabilities of science and engineering aren't making it into government. That may be because scientists and engineers are linear in their thinking, and politics is anything but linear, and the government is going to be politics. It's a commonly felt beef among scientists and engineers that the government just doesn't understand. It's therefore fulfilling to find and get involved with ways that really do work for getting that connection made.



23-00:44:57

Redman:

This is speculation on my part, but is the state government functioning with sort of hands-off attitude—you guys do what you need to do in your taskforce, in your working group, and then come back and talk to us—so then there's not as much meddling, and these groups can really work on the problem? Is that what happens?

23-00:45:24

King:

Since there isn't much science and technological capability within the state government, of necessity it's going to be hands-off while we do some sort of technical analysis. I think that difference that I pointed out between CCST in California and the National Research Council on the federal level is an important difference. That is our keeping plugged in with the agency all the way through a study, rather than this quite hands-off view at the federal government level. I think the hands-off view, and the fact that it goes through a full laborious review before release—as CCST reports do, but way more involved at the federal level—those things at the federal level can make a National Research Council study not address the hot issue of the moment when it comes out, whereas if what is the hot issue and what's bearing on it changes continually within the state, the CCST approach, by being plugged into that as it changes, and maybe with the target you're aiming at thereby changing all the time, it works better.

23-00:46:57

Redman:

I'm assuming that that probably also fosters personal relationships with those government officials that you're asking to listen to you.

23-00:47:08

King:

It can be very helpful, yes. Yes. There is a large reservoir of information and “here's how it really is” sort of thing with those people. That's quite useful.

23-00:47:24

Rubens:

Much of it is during your position as vice president of the university system.

23-00:47:32

King:

Yes, that's helpful. That's something I have promoted all the while I was there and since I have been there at CCST, that it is vital that they have at least one member of the council who is a high official within the university, administratively. Not just faculty.

23-00:47:55

Rubens:

We have ten minutes left.

23-00:47:59

Redman:

I would like to take that ten minutes and wildly switch gears, if that's all right. Surprise! You have a reading assignment, actually. I wanted to just spend a few minutes, maybe ten, maybe a little bit more, talking

about your patents—you so kindly brought your list. You’ve just got so darn many of them that we should probably pick some representative examples. If there were some that you would like—

23-00:48:29

King:

Are you going to let me look at the list and refresh myself?

23-00:48:31

Redman:

I am.

23-00:48:40

King:

Why the interest in patents? Patents count practically nothing in the advancement process at UC. Something that’s had a big impact on the world can count more, so a patent with royalties and with five of them built somewhere might count for more. A patent isn’t a publication. They’re different things. What it takes to get a patent is not those things that are most measured with regard to the quality of research. It’s just whether a way could be figured out to show that this is something new and sufficiently unobvious so that it could be granted a patent. Sufficiently unobvious as opposed to impressively creative. Impressively creative works with the Budget Committee. Sufficiently non-obvious works with the patent examiner. I had a latent interest in getting patents and trying to get my work used. Why not? You shouldn’t be all ivory tower. You should have some good results from it all out there.

I’ve been through a host of different things, really two different eras, on patenting. I’m not a person who’s got a lot of these patents known to be in large-scale commercial use. That isn’t the case. But as I started off with my patenting with the federal government—this would be before 1980, which is the year that Bayh-Dole Act came in on the national level—before then, the patent was in the public domain. There was no ownership of it if it came from government-supported research. Most of my research in that time that was susceptible to patents was Department of Agriculture, U.S. government. The Department of Agriculture was very desirous of patenting. When in doubt, patent. The reason was to be able to show, I guess, in their report cards for the local Department of Agriculture Lab up to the secretary and his or her people in Washington, that they’re doing good things. Practical, useful, patented.

An early one, with Peter Clark, which was a method for freeze drying, that was done because, in discussions with the liaison people and the patent lawyer who was at the Department of Agriculture Lab, they felt that should be patented. Ditto for a novel ice condenser, and ditto for what was called slush drying, and ditto for another kind of novel condenser. Of those four, the only one I know that got any commercial play was the first one, the freeze drying method. I know that because

of what I found out during my years of consulting with Proctor and Gamble, where I actually had pointed this patent out and they were aware of it, and they had something close to it that they had been thinking about, et cetera. I believe that has been built on a production scale. I haven't visited it. The others went nowhere, and I think it was because of the public domain aspect and the fact that the corporation that was going to take the ball and run with it did not have a way to own it and prevent others from using the exact same thing. That's what Bayh-Dole was intended to cure, by giving the patent to the university, who could then put it out on exclusive license to someone. That's what most of my other patents are.

As we get along later in my career, the last four, certainly—the last five—are all on ways of recovering carboxylic acids from aqueous solution. That was all Department of Energy-sponsored research through the Lawrence Berkeley Laboratory. The Lawrence Berkeley Laboratory has its own technology transfer office and is interested in getting things out there. Things have gotten more sophisticated now. They're not interested in just sending in a list of patents to the Secretary of Energy. They're interested in proving that things are out there being used, and licensing for that purpose, and doing exclusive licensing. There's a portfolio of four of these carboxylic acid separation patents that Lawrence Berkeley has worked with for about eight years—or more. Actually, let me be careful here. More like twelve years. Trying to market [them] as a group. We have had the fish on the line. The fish has never swallowed the bait and gotten the hook firmly into the fish's mouth, but there certainly was a lot of nibbling on those four. Then there are aspects of my work that wouldn't fall under patents, but which come out of the publication process, and so I am aware that technology, with regard to recovering carboxylic acid by extraction with tertiary amines, has gotten itself used on quite a large scale. That is built upon research that was published as research but not patented.

As I look back on the patenting, I believe that, from my own personal experience, the Bayh-Dole Act was a good thing because of enabling ownership. A second thing I believe is that universities are inherently at a disadvantage on marketing patents, because the poor person sitting down there in the university tech transfer office has got to understand everything there is, because everything there is within the university somewhere, coming forward with possibly patentable ideas. In a corporation, there's a core business of the company, and the patent lawyers there will understand that core business quite well and can get together with management and decide what to patent and how to write it up and why. In our case, in universities, that decision is much more difficult for the people charged with it. The way we work, the university goes and get somebody from the outside to come in and

write up the patent [application] if it's going to be patented. I've been through many of the in-depth conversations with people of that sort. Many different ones over the years. Some are very good at it. Some understand your area well. Some have the same problem that the university technology transfer office has, which is that they deal with so many different things, they can't understand any one or few of them that well. It's tough for universities to get the patents written in a good way, and to know what to push in marketing and how to push them in marketing. That is a problem, and it's inherent to the extreme breadth of what goes on in universities, and hard to know how to work with.

However, having looked at this now from the top of it all, too, what is in the university's primary selling patent portfolios, what gets used the most, what are the top ten or twenty moneymaking patents, the answer is not chemical engineering, because that's processes, which are very hard to protect. What is big on the university's patenting is things that are medical and biotech, and things that are agricultural, like a very pickable tomato or an easily harvested strawberry. That's the two areas where the university is getting most of its patent royalty money. It's interesting.

23-00:57:39

Redman:

Just to round that out, I can't help but ask you—you had said that patents don't factor into advancement cases. I assume that that's not the case if they sort of come along with a corresponding publication that you're writing about.

23-00:57:58

King:

Everything that I've patented, there is a corresponding publication. That world has just changed, by the way, with the new patent law that's just been passed. It goes from first to invent having the rights to the patent—excuse me. That was the old one, first to invent. Now it's first to file. It's a very different game, and that's going to disadvantage universities more, because we're not the fastest filers.

23-00:58:28

Redman:

Right, for all the reasons you just said. Interesting. A personal question. Patents weren't necessary for your career, and probably didn't gain you much applause from the department. How did you celebrate when you got a patent?

23-00:58:53

King:

I don't remember celebrating.

23-00:59:00

Redman:

You've got a lot of these to make up for.

23-00:59:05

King:

It was just good to have. The reasons for doing it, first of all, in the old days, pre-Bayh-Dole, USDA wants to patent lots of things, even though it's in the public domain. Fine. Play ball with your research sponsor. That's essentially what that was. Then as I got more sophisticated at this, I could recognize things that were inventions and probably should be pursued. It is also very true that the number of winners per patents and inventions pursued is very small. I remember being on one of my review panels. It was the panel for the director of engineering at the National Science Foundation. We were presented with a study that the NSF had done. Congress had wanted indication of whether NSF research had done practical good for the country or not, and so what was the outcome of patents from NSF—have I described this?

23-01:00:04

Redman:

You have. The one—

23-01:00:05

King:

All right. One patent out of all those many controls the whole thing. That's generalizable. That will always be the case. So you have your twenty patents, and the likelihood is one of them is not going to make big, but maybe it will. That's the other part of why do it, is, maybe it will.

23-01:00:27

Rubens:

Were there one or two you thought you should have pursued but didn't?

23-01:00:35

King:

No, I always was careful to disclose when I thought there was something that should be disclosed. I would err on the side of disclosing, and then it's for the tech transfer office, originally at the system level and now at the campus level, or at the LBL level, to make the decision of whether to pursue it. The university has a policy that they will release it to you if they choose not to pursue it. I never had one that got in that situation. I believe they pursued everything I gave them.

23-01:01:15

Rubens:

When did it transfer—technical transfer—when did it transfer from the office of the president to the campus?

23-01:01:25

King:

It was late in my time as provost for the Berkeley campus, so it was about '92 or '93. Different years for different campuses. Now all have devolved, including Merced.

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Audio File 24

24-00:00:00

Rubens: I've been meaning to ask you if you were you pretty good at computers? I don't think we ever asked that? You had talked about sitting on the floor, sorting cards when you structured a conference in San Francisco.

24-00:00:38

King: I do not think I'm pretty good at computers. I can, hanging on by my fingernails, keep the computers running at home. That I can do, but I don't think I'm pretty good at it, and I'm probably like anybody else in my generation for whom it was a Johnny-come-lately thing. I simply had to learn it. I do have an interest in computer history. As a graduate student at MIT, I was at the Oak Ridge Practice School station, as I mentioned many interviews ago. They had one of the earliest digital computers there in 1957, something called ORACLE, which was Oak Ridge Automatic Computer and Logical Engine. We learned to program that while I was a student, and it involved very, very rudimentary steps, like go find a number which is located in storage here, bring it to the register, leave it there. Now go find another number, bring it to the register, add the two numbers in the register, and put that number back here. That's the kind of programming we were doing. That is plenty rudimentary. So I have lived through the whole computer age.

24-00:01:52

Rubens: Yes, you were dean '81 to '87. Did computers come in during that period?

24-00:01:57

King: I started using word processing I think something like 1983 or four.

24-00:02:03

Rubens: During your dean years the whole administrative apparatus of the college must have gone computer. Not particularly your domain, though?

24-00:02:13

King: No, not particularly my domain. It certainly did increase the accessibility of information, though. When I was dean, our business manager was able to give me much more detailed reports and much more current reports than would otherwise be the case.

24-00:02:30

Rubens: I think it's an important piece of history. It's so assumed that it's the digital age. The other little piece I want to just dip back into history

about is that in addition to Yale, there are at least three other schools that you reviewed or gave advice to.

24-00:02:56

King:

Those were, all three, in the mode of starting up what's called an external advisory committee. It's the sort of thing I had done when I first became department chair here. The idea was to bring in people who were knowledgeable in the use of chemical engineers or training chemical engineers at other institutions, and who could give good and useful advice, where the stature of those people was enough so that your administration might listen to what you wanted to put forward from that advice. It became a fairly common practice back in those years. I would say it was a very rare thing in the seventies. It became much more common in the eighties. That related to the much greater involvement with industry that started along with the Council for Chemical Research. The three places I happened to do this, each of which asked me—I didn't go to them in any way—one was the University of New Mexico, in Albuquerque, and that was very interesting to do for three or four years. It showed me a very different type of public university, one that had much more politics involved in the selection of the leadership and the continuity of the leadership of it. It was not insulated in the ways that constitutional autonomy and even the board of regents give to UC. That was an interesting view on another public university, one that had many more barriers to overcome, and steep hills to overcome, than was the case for UC.

Subsequently, I did the same thing for Louisiana State University in Baton Rouge. That took lots of gearing up to go down there, because I am not a person for high humidity and heat, and Baton Rouge is that. I can even remember walking across the campus one day and you couldn't see the other side because of this thick, hot fog. I did LSU. That was a different sort of operation. It had been, actually, a very well-established chemical engineering department at times, fairly early on in chemical engineering. One reason was sugar processing and the fact that that's big in Louisiana. They had done a lot of it. That was a way to look at a department that had been there a longer time, had some history. Again, a different but also more difficult situation with the state government than was the case in California.

Wisconsin came along much later. It was just the point in time when they started an external advisory board that I did it. They are different in that that university has, in a number of the national surveys, been right at the top of the field of chemical engineering. You don't associate that with the University of Wisconsin as an institution, but within chemical engineering, it had done that. A lot of the rise was things we talked about, which was transport phenomena and the big book on transport phenomena by Bird, Stewart, and Lightfoot. That

really brought them to real prominence. Wisconsin, it was a brand-new thing that they were doing. They had some academic members, of which I was one, but a lot more industrial members. Wisconsin, having been around and being a very established institution, had a number of very prominent and accomplished alumni, some of whom were on that board. I remember one who sat on there with me was Lee Raymond, who, for a decade, was the CEO of Exxon, and then Exxon Mobil after the merger. A delightful individual, and a Ph.D. chemical engineer from Wisconsin.

24-00:07:12

Rubens:

What was he like?

24-00:07:16

King:

He was very pleasant. You would not have that impression from what you've read in the newspapers about Exxon in subsequent years. I found him just fine to work with. Those are the three things of that sort that I did. Advising other departments. Many of the same dynamics were at play that were at play when I started the one back when I was chair of the chemical engineering department here. Sometimes the institution would get advice it didn't care to hear at all, and then it would be interesting to watch what they decided to do with that advice. On the whole, I think it's a healthy thing, and I'm very much in favor of that sort of activity. I do think it's good to bring academics together with industrial people and possibly some government people on these advisory boards.

24-00:08:08

Rubens:

You had been circulating in national councils, of course your own consulting world earlier. Is this just another forum where you're meeting people and you're honing your skills of assessing institutions?

24-00:08:24

King:

Yes. I think one reason I was there is because I had been chair of the prominent chemical engineering department that's here at Berkeley for nine years, which is a long time. Then I was this other unusual thing, a dean, but not of engineering—of chemistry instead. I think that background was interesting to them.

24-00:08:47

Rubens:

Similarly, you met people.

24-00:08:49

King:

Sure. That was one of the many ways in which I would develop a network of contacts around chemistry and chemical engineering, which is very useful.



24-00:09:00

Rubens:

Does this fit in now? There's the Michigan Biotech Institute.

24-00:09:04

King:

Yes, I did do that also. That's something different. That is something that was set up by the state of Michigan to try to foster a biotechnology industry in the state of Michigan. Part of what do you do when the automobile industry is dying, or worse. The state of Michigan, by—I believe it was enactment of their legislature and a bill signed by the governor—established this Michigan Biotechnology Institute, which was placed jointly under the University of Michigan and Michigan State University. As a sidelight, that's an interesting manifestation of how the Master Plan is good for California, because in Michigan there is no master plan. The University of Michigan and Michigan State compete right at the level of the legislature, with the attendant inefficiencies and need to do something like have both of them be in charge of this research laboratory. So they set up a research lab, brought in a director and some senior staff who were prominent in biotechnology. The idea was to try to get research and development going in a way that would be catalytic to the development of an industry in Michigan. It didn't work all that well.

24-00:10:27

Rubens:

How many of you were brought in?

24-00:10:31

King:

I don't really remember, but I'll guess something like eight of us.

24-00:10:37

Rubens:

How often are you meeting?

24-00:10:39

King:

We would go there maybe three times a year at the beginning, and two times subsequently.

24-00:10:42

Rubens:

Where was it?

24-00:10:43

King:

It was in Lansing. That's the state capital. Near Lansing, I should say. State capital, and is the location of Michigan State—East Lansing is.

24-00:11:04

Rubens:

This is in the category of service?

24-00:11:09

King:

Well, and halfway over to consulting, because that was paid service, and so a form of consulting.

24-00:11:18

Rubens:

Shall we turn to your administration as provost for professional schools and colleges? We introduced it a little. Do we want to begin with your views on the two-provost system?

24-00:11:38

King:

I'd be glad to do that. That was something that I believe has occurred at Berkeley and nowhere else that I have found, even in the rest of the world. Why it was started, and through what inspiration, I don't really know. George Maslach was the first occupant of that position. That was during the time of Albert Bowker as chancellor. Obviously, he must have had much to do with creating the system. His academic vice chancellor was Mike Heyman, so that's the other person I presume was involved in coming up with the structure. Let me describe it first, because it doesn't exist anymore. I thought there were some very good things about it, which I'll go into. The idea was this. Berkeley has a giant college of letters and science. There was, at that time, a dean of the college of letters and science. That had been Rod Park before he was chosen as Heyman's academic vice chancellor, and I think Lincoln Constance before Rod Park. All of that era is described in a little book that Rod Park recently wrote, with the interesting name of "It's Only the Janitor." It's a self-published book. Rockpile Press. His vineyard is Rockpile Vineyard, up near Lake Sonoma, outside of Healdsburg. He wrote this delightful little book about a year ago. Very short.

24-00:13:19

Rubens:

John Cummins has mentioned it.

24-00:13:21

King:

Oh, it's really worth reading. It's vignettes, as only Rod Park could put them together. The title is "It's Only the Janitor," which has to do with some particular point in time when he was coming out of California Hall during one of the periods of student unrest and demonstrations. He'd gone in off of his sailboat, so he was dressed in sailing clothes, and I guess rather ordinary clothes at that. The demonstration is going on, and he's led out the door by the campus police who were monitoring the door, and he starts threading his way through this crowd of chanting students. Somebody starts saying, "Oh, it's only the janitor. Let him go through." They didn't know who it was. That's the title of the book. He's written lots of things in there that are quite interesting.

Anyhow, Rod had been dean of letters and science. So had Lincoln Constance before him. That was a very large and important position on campus, given the extreme size and variety of things within the college of letters and science. Meanwhile, there are all these other colleges that have undergraduate as well as graduate programs, and then

professional schools that typically are a school that is also a department, and is quite professional. The decision was made to go to a form of organization where there were two provosts. There was a chancellor. There was then a position that got called The Vice Chancellor, with capitals on all three of those words. Then there were the two provosts. One provost was also the dean of the college of letters and science, so it was provost and dean of letters and science. During my day, that was first Len Kuhi, and then Carol Christ. Then the second position was provost for professional schools and colleges, and so that would be a provost who had responsibility for the four other colleges—environmental design, chemistry, engineering, and natural resources—and the nine professional schools. That was what I found myself in. The way I got to that position was that the College of Chemistry, perhaps not the way chemists would like to think of it, was, by definition, a professional college, because it wasn't L&S. That's the way I got there, was as a follow-on to my term as dean of the college of chemistry.

What I think was important about that position was that, first of all, much more attention could be paid to the individual issues of these professional schools and colleges than could be paid by somebody who's looking at L&S as well. Secondly, there are really common issues for the professions, and they are complicated and important issues within a comprehensive university setting, like Berkeley is. The most obvious was what constitutes creative activity in the professions. The academic personnel manual gives you your four criteria by which faculty are judged, and one of them is research and other creative activity. Within the professions, it becomes important to look at what the creativity is outside of a narrow definition of research. That was the issue I was continually facing. I faced it in part because all the personnel cases came to me for final action. If the Budget Committee was recommending negatively with regard to somebody who had been recommended positively by the unit, then the obvious thing to do is look and see if the creative activity of the person has been properly recognized and evaluated in the review. I was forever doing that on case—

24-00:17:53

Rubens:

What are some examples?

24-00:17:59

King:

Here's the clearest example: an architect. A professor of architecture, who is in the field of architectural practice, is probably going to have very few writings. Yet there are some extremely distinguished people there. Take, for example, Joseph Esherick, who was very prominent in architecture and environmental design here for many years. That sort of person, their creative accomplishment is the buildings that they

have designed, and how they have been judged by people who judge the design of buildings, and therefore what architectural awards they have won, among other things. It isn't a bunch of papers. They may not have the papers, and even if they do have the papers, the papers are going to represent maybe 10 or 20 percent of their creativity, whereas the works themselves reflect that the rest. Now, there are similar questions in journalism—a much smaller school, but one where it's a very practice-oriented school. A person is going to be recognized and evaluated off of their writings in journalistic media, which means op-ed pieces, stories, how they handled a scoop, what creative ways they had of putting it across. Yes, journalism does have radio and television, and now all media, in addition to newspapers. So there's another example, journalism. In law, what is written as papers in law would typically not stand up well by the criteria of letters and science for scholarship and creativity. It would be development of the law, how the law had been changed over the years, what caused the law to change, et cetera. It's a different sort of thing. It goes on through the other professions, too, one way or another.

Also, all the professions have, in some way, shape, or form, what's called a practicum. Namely, you get out and do the profession for a while. Law had a clinic in downtown Berkeley, a free clinic. Engineering, for many years, had a co-op program, where you could go and work for corporations, with some academic evaluation of what you were doing there. The others had other sorts of things. The School of Journalism, for example, is now running three online media of their own in different parts of the Bay Area.

24-00:20:59

Rubens:

You also mentioned, regarding your own experience, that patents weren't considered the same as papers or research suitable for tenure review and step advancement.

24-00:21:08

King:

But that can be an expression of creativity, and so if it is there, then it was again incumbent on the provost, who was the one person looking at the professions as professions, and professions as a whole, to try to make sure that creativity was being recognized in the right way. That's one issue surrounding professional schools. There's another set of issues that has played out in various ways at Berkeley. That is professional schools that, in a sense, end up dealing more with conventional L&S type research and scholarship rather than the special creativity of the profession. That has been an issue at Berkeley over the years. It shows up in the elimination of the school of criminology, which was before my time. I have no firsthand familiarity with that one. I do have firsthand familiarity with all the issues surrounding the school of education, where Neil Smelser and others led major reviews

of it. Mike Heyman ended up making a decision that, even though there was pressure to eliminate the school of education, that, A, you couldn't do that, being the major public university in a state like this, and B, the important thing was to get it back to professional creativity and more towards practice. It should be a true professional school. So he had hired Bernie Gifford to be dean of the school of education, and I was there as provost during Gifford's first several years. He preceded me. He came into office before I did, but I was there contemporaneously with him as he was trying to do this change within the school of education. That same issue is wrapped up in the story of the school of library and information studies—its closure and then the subsequent start of a brand-new school, which was first called information management and systems, and is now just called information. So there are unique issues to professional schools and colleges. That's the prime reason I thought that was a good organization. The secondary reason was that it did enable more attention by somebody at the level of provost to these schools and their issues and their deans.

24-00:23:48

Rubens:

Did you report to the vice chancellor?

24-00:23:52

King:

Yes, I reported to Rod Park. The meetings I would have are indicative. I would, I think, very frequently, something like once a week, have a meeting with Rod Park, and then with less frequency, but with regularity, I would have a meeting with Park and Heyman together. Then after Heyman, Tien, and after Park, John Heilbron.

24-00:24:18

Rubens:

Tien was not vice chancellor for research while you were—

24-00:24:25

King:

No. No, he was not. He was vice chancellor before that. It was as I got into that provost position that Tien started looking at his own career and decided a good thing to do would be another line of experience. He was then the executive vice chancellor at UC Irvine.

24-00:24:55

Rubens:

Shall we go on? You faced three major issues immediately when you became provost.

24-00:25:02

King:

Oh, yes. It's interesting. I faced three major issues immediately. I think it was on my very first day that Mike Heyman pulled me aside and said, "Listen, we need somebody to ride herd on the decommissioning of the nuclear reactor, and you're certainly the one whose expertise comes closest to that, so we're going to ask you to do that." That's a story unto itself. It was a very interesting endeavor. The second thing

that had a lot of import for all the rest of my time as provost was I remember, at a meeting of the Building and Campus Development Committee, as I think it was then called, within my first week or two as provost, the subject was the business school. There had been an issue, a major issue, as to what and where the new business building would be. It had been established before I got there that there would be new facilities for business. Barrows Hall was just nowhere near what the business school needed to be a top flight business school. The architect had been selected before I got there, and that architect was Charles Moore, a big California architect. His firm, in fact, is the one that started off the buildings at the Sea Ranch and many, many other projects.

Charles Moore was there for that meeting of BCDC. Into the room walked Mike Heyman and Charles Moore. Mike started off the meeting by saying he and Moore had now agreed as to what should be the site of the business school. It should be the site of Cowell Hospital, so as to provide a sort of gateway to campus on the eastern end of the campus. This decision, it was pretty clear, had been made on grounds of imposing location, appropriate location, but without the practicality of the matter having been discussed that much or having been thought through.

24-00:27:13

Rubens:

The practicality meaning how to close the hospital?

24-00:27:15

King:

Well, yes. Cowell Hospital was well-occupied by a student health service and by about half of the School of Optometry. What now to do, since you had a displaced student health service with no funds or project to get at a good location, and you had a displaced half of the school of optometry, and what to do about that? The optometry portion of that one occupied a lot of my time in subsequent years as provost. What we ended up doing was to decide to increase the height of Minor Hall by two stories. That is a project that's very satisfying to me. That is one of my building committee projects, too. You can go stand in front of Minor Hall today and you can't see that it was raised by two floors, nor did the bulk become so great as to have a, shall we say, Evans Hall effect in the vicinity.

24-00:28:28

Rubens:

Who was the architect that did that?

24-00:28:30

King:

I do not remember. It was a local firm, Fong and Chan. It was very nicely done. Then the third one that appeared that was literally in my inbox the first day I came into my position as Provost of Professional Schools and Colleges was a report that had been done by a more junior

member of the administration, evaluating a substantial number of recent tenure cases in the law school, and coming to the conclusion that there had not been a consistent application of standards, and that the outplay of that had been what amounted to a differentiation by gender. A very hot issue, very important issue, and one that also took quite a bit of my time. That one was interesting because it was, in effect, accusatory of the law school, but not just the law school, because all tenure cases are acted on by the Budget Committee as well. It was addressed in part to the law school, but also in substantial part at the whole review system. There was a hot potato for a brand-new provost. It was interesting. I had had—I think it was something like nine transition conferences with Doris Calloway. She never mentioned this. Just simply left it in my in-basket. We sort of joked about that in years later.

24-00:30:18

Rubens:

Where did she go?

24-00:30:20

King:

She returned to the Department of Nutritional Science as a professor.

24-00:30:26

Rubens:

Do you want to unpack those or do you want to talk more in-depth about one.

24-00:30:29

King:

The one I would be interested in talking about more is the nuclear reactor, because it had a lot of things attached to it. An absolutely unique situation. Berkeley's nuclear engineering department had had a very small—small in terms of radiation output or power output—a nuclear reactor that was used for research purposes. It was a TRIGA reactor, which is an acronym for Training, Research, Isotopes, General Atomics. It was not in any way a power reactor. Very low level of activity. The use of this had slipped. It wasn't being used that much for the educational process of the department. It was being rented out to some outside firms so as to derive some income. The site was pretty well chosen at that point as being the site of what became Soda Hall, the computer science building. It adjoined a basement of Etcheverry Hall, which had already been built, but it was out to the east of Etcheverry Hall, and that is the area that became Soda Hall. It had been established that this nuclear reactor would be taken down.

Well, you don't just take down a nuclear reactor. That is a process known as decommissioning, which is overseen by the Nuclear Regulatory Commission and has an enormous amount of structure and process to it. This functioned like a building committee, and so I was chair of this committee. First, Tom Pigford, and second, Ken Fowler, were the people from nuclear engineering with the know-how, being,

in effect, the chief technical officer of the committee that was overseeing the decommissioning. We had a lot of involvement from other people on campus who went through the permitting process, and the processes of dealing with the city of Berkeley, the state of California, the Idaho National Engineering Laboratory, which is where the fuel rods were to go, also the Nuclear Regulatory Commission. As we went along in this project, we developed a critical path diagram. What had to succeed what, in what order. I have seen many critical path diagrams in my day. That's a common thing in engineering. This is by far the most complex diagram I had ever seen. All kinds of things had to happen in a particular sequence and order.

We went through all of this, and it took probably a year and a half or two years to do that, and we got to the point where we were ready to move the fuel rods out. At that point, you deal with the city of Berkeley and with the Idaho National Engineering Lab, which is where they're going to go. The fuel rods belong to you until they get to an interstate highway. Interstate highways are the property of the federal government, so our job was to get them to an interstate highway. As the city of Berkeley first got involved, we had to deal with both the city council and the Peace and Justice Commission. Part of the Peace and Justice's charter—that is a part of the Berkeley city government—part of their charge has to do with the fact that Berkeley was then, and is now, by city decree, a nuclear-free zone. You see signs saying this on the edge of Berkeley as you come in. The first dealings with the city were very practical in nature. The city's position was, well, don't take them through the city to get them to the freeway; take them to Orinda. Well, going to Orinda would involve going over the hills. You can't take the fuel rods through a tunnel.

24-00:34:56

Rubens:

Is the city rep literally coming to these meetings?

24-00:35:00

King:

Our people would be dealing with the city principals. We then had to make the determination that, no, we don't want to go over those curvy roads over the hills behind the campus. We will have to take them out through the city of Berkeley via University Avenue. Then the next thing that came from the city was, well, would you please let us know the date and time you are going to do that so that any people in the city who wish not to be around as these hot things go out down University Avenue can remove themselves from the city? It seemed to us that a free translation of that would be, please tell us the time of the shipment so that we can lie down on the street and prevent the truck from coming through. This was the Peace and Justice Commission asking that. I am sure that there were those interests. It turns out that it is against U.S. law to tell the time, place, and manner of a nuclear



shipment, even for our itty-bitty bit of radiation. Of course, that was written for things like uranium for atomic weapons. Legally, we could not tell them, and so we went back and told them that. They said, well, then will you please go to the federal government and get that law changed? To put some teeth in that, the city then took the position that, until we had done that, they would deny the campus the things they could deny them, which, in particular, was what are called curb cuts: cutting through the curbing on the edge of a street to provide access to a new building. We did have new building projects. In effect, the city was holding up new building projects on this issue. That finally got resolved with the city. I do not recall well how, because certainly we didn't get the law changed in Washington.

So we were set to move the fuel rods. About two days before the date on which we were going to do that, the governor of Idaho decided that this was the time to make a pronouncement. The pronouncement was that he was allowing no new nuclear material to cross the borders of Idaho to come into that national engineering lab, and so this was a form of making some political hay in Idaho. Here we were, with fuel rods ready to ship and no place for them to go. It took, I think, two or three months to get around that one. The governor got whatever he wanted in return and removed his prohibition against nuclear material crossing the border, whereupon the trucks picked up the fuel rods, went down University Avenue at 3:00 a.m., got to the freeway, and the government had it from there. Looking back on that, the sequencing and the number of things to be done right in various places all around the state and the country was very, very striking. That was a complicated and difficult operation.

24-00:38:26

Rubens:

That must be a historical document. Is it around somewhere?

24-00:38:30

King:

Somebody in architects and engineers would have the file on this. It was quite a procedure. I do have a file on this effort, probably including the critical path diagram that I'll look for.

24-00:38:37

Rubens:

The city's interest is part of the traditional town-gown conflict?

24-00:38:43

King:

It all gets factored in together, yes. There was even a tenure case that I had delved into as provost that was on the subject of exactions, and I ended up reading some of the papers on exactions. I then learned what exactions were. That's the exact process that was going on. For the city to give you a permit for something or other, they want to get something back that isn't related to the project but is of use to the city. One exaction that came out of the Berkeley campus in those days was

a nice new red fire engine for the city of Berkeley. I remember that one.

24-00:39:28

Rubens: Exactions are?

24-00:39:31

King: They want their fire engine, and so a discussion goes on. The argument will be that they provide fire services to the campus, and that's expensive, and here we are not even paying them anything because we're not subject to tax, and so surely the university can do something to help defer all of these terrible expenses that the city is incurring for fire protection. You then have that discussion going on, and then you have the curb cuts and the nuclear reactor, and you have whatever other discussion related to whatever other building aspect. They all sort of get solved together with the exaction.

24-00:40:17

Rubens: It must have occupied a lot of your time.

24-00:40:21

King: Yes, that was a very heavy project.

24-00:40:24

Rubens: Were you meeting also with the university's attorney, with Mike Smith? Had to be part of that process.

24-00:40:30

King: Oh, sure. Yes, yes, yes. Probably, although I don't remember whom, the specialized legal expertise of the university resides in the people who are in Regents General Counsel at the office of the president. We probably had the nuclear expert or decommissioning expert from there involved as well.

24-00:40:55

Rubens: Do you mean from the Office of the General Counsel?

24-00:40:58

King: Yes, it's what the legal services to the university are. It's called Regents' General Counsel. There's a person who holds that position and title, like Jim Holst was for much of my time, and Charles Robinson is now. Their staff is made up of attorneys who specialize in different things.

24-00:41:21

Rubens: What happened to that space?

24-00:41:32

King: That space is the basement of Soda Hall, part of it. Part of the basement.

24-00:41:40

Rubens: Somebody told me that you can go into it, but you have to walk on paper.

24-00:41:46

King: Well, we did, in the days when we were doing that. That's a matter of not tracking radiation back out. It was a swimming pool reactor, so the rods were down in water. That's standard operating practice on anything having to do with radioactive material. You walk on a tacky paper, and what it does is remove whatever is adhering to the soles of your shoe.

24-00:42:13

Rubens: I assume it's lead containers that are hauling out the—

24-00:42:17

King: Yes. They had lead bricks there to serve as a radiation shield.

24-00:42:23

Rubens: Once on the trucks, when the trucks are going through—

24-00:42:26

King: Yes, I suppose. I didn't watch the trucks as they rolled out.

24-00:42:31

Rubens: Just breathed a sigh of relief.

24-00:42:33

King: Right! On to the next project.

24-00:42:39

Rubens: Do you want to unpack a little more about the business school? Were you part of the whole discussion of health services going to—

24-00:42:51

King: Yes, yes, yes. I had a lot of involvement in that. One thing I do remember is I chaired a building committee for the business school building, too. At what we knew was going to be my last meeting before I went down to Oakland to transition down there, we were having meeting number fifty-two of the business school building committee. I had been there from meeting number one.

24-00:43:19

Rubens: Over seven years.

24-00:43:20

King: Yes, as it all went on. There was the design of the business school, which was very elaborate and done by this very noted architectural firm. It is, of course, three separate buildings. The layout of that, the layout within it, the use of the offices, space for students, et cetera, was all part of that process. The engendered projects, the relocation of

the student health service, that's what is now the Tang Center. That's privately funded, I believe, with money from the Tang family. That family are big supporters of Berkeley. However, I didn't have to deal with that one. Somebody else chaired that building committee, but I did have the optometry one. That one, once we knew what the need was, which was to relocate people displaced from Cowell Hospital, as it would be taken down, we went through a process of, what do we do to accommodate them? Was there space available somewhere else nearby to put them in? Finally came to the decision that there wasn't, and therefore the best way out was adding these two floors to Minor Hall. Then we had a building committee for that that oversaw the addition of the two floors to Minor Hall. That all had to be done before Cowell Hospital could be taken down. There's a big sequencing to these things. [the] Tang Center had to be complete enough before Cowell Hospital could be taken down, and then Cowell Hospital had to be taken down before you could start on the business building. It's a very sequenced operation.

24-00:45:14

Rubens:

Were you part of the decision process of choosing for UC not to have a hospital?

24-00:45:22

King:

No, that was before my time. It was not a hospital at the time of the business school decision. It was a student health service, as it is now.

24-00:45:35

Rubens:

With the school of optometry? I didn't realize that.

24-00:45:36

King:

Yes. If you had the measles, you didn't go into Cowell Hospital.

24-00:46:00

Rubens:

When did the business school open? You were long at the OP. I can look that up.

24-00:46:07

King:

The new business school buildings opened after I was down in Oakland. I went to Oakland July 1, 1994. It was sometime shortly after that.

24-00:46:18

Rubens:

Really? So that went up pretty quickly.

24-00:46:20

King:

Within a year or two. 1987 is when I became provost. That's when the site decision was made. 1994, seven years later, the building isn't finished yet. I think we add one or two years onto that, and then the building is occupied. In that sense, nine years from choosing the site to having a building.

24-00:46:46

Rubens: You must have been there at the opening. It must have been pretty celebratory.

24-00:46:50

King: Oh, yes. That was fast, of course, compared to Tan Hall, which was a seventeen-year process.

24-00:46:59

Rubens: Which you overviewed. Is there anything more you want to say about the law school? We outlined what it is. We don't need to go into personnel matters.

24-00:47:07

King: That was the issue. One thing I had to do was—it may not be the best word—improvise the review process. That is, due to the special nature of what this was about, we had to get a process going that would use a variety of reviewers, in the right way, for the right things, to tell us if we had a problem. Then, of course, there was the issue of what to do if we did have a problem. Let me say that I think, as we went through all of that, the outcome from it is a much healthier situation.

24-00:47:51

Rubens: Looking back, you're pleased with the way in which—

24-00:47:53

King: With the ultimate result. I was by no means the only actor in it. My role was really to catch the hot potato when I found it in my in-basket, and to work with Rod Park and Mike Heyman and others to try to figure out what to do. Mike had to recuse himself from that, because he's a professor of law.

24-00:48:18

Rubens: I see. I should have thought that. One of the things that you wanted to talk about is how you came to know the various PS&C units.

24-00:48:34

King: If there is a commonality throughout all the things I've done administratively, it is an enjoyment, a true enjoyment, in getting to know something brand-new and figure out what makes it tick, and by so doing, get to the point where I can work with the dean or whoever it is that's in charge of what the something else is, enough to help address the problems and needs well. The professional schools are all very different from one another. We also had the fact that the science side of the campus doesn't know much about the non-science side of the campus and vice versa. I was a real unknown to many of these professional schools and their deans. I had come out of the one professional school that would be thought of as least professional because of the aura of chemistry on this campus, and all the Nobel Prizes, and the fact that [the college of] chemistry is thought of mostly

as chemistry rather than chemical engineering, because that's what was the historic stature and bulk of the college. Chemists were people who would have very, very high academic standards, so there was a real possibility of being thought of as somebody who came from a different, nonprofessional world and just simply wouldn't be good for the professions.

For that reason, and also because I had found it very effective in my work as dean of the college of chemistry, I decided the first thing I would do is go visit each professional school. I did it by going to them, and would spend three or four hours for one of these visits. I would discuss it a little with the dean beforehand, but very largely leave it up to the dean to decide what they thought might be best for this visit. I remember when I completed the visit to social welfare, where there was a very long-term dean by the name of Harry Specht, a very good dean. If there's anything that is the most different from chemistry and chemical engineering, social welfare is probably it. I did my four hours. Harry then came to me the next time we had a one-on-one, and he says, "When they announced that this new provost was going to be somebody from chemistry, I thought, oh, no, this is the end. Then you came for that four-hour visit and you showed that you were interested in us and wanted to understand what we do and actually seem to value it. That made all the difference in the world to us and to me." Me being Harry Specht. That's probably the most extreme such reaction, but there were others, too.

What was interesting to me is that the dynamic was unique to the school. What was it they were trying to do, what did they value, how did they work with the profession. Same needs for the different professions, but it had to play out in the world of that profession. It had played out in very, very different ways, and that to me was absolutely fascinating.

24-00:52:17

Rubens:

There were various stages in which some of these programs were. As you said, education was now trying to—

24-00:52:23

King:

Education was trying to come back from what had been a very stressful period of probably four or five years of these reviews having to do with its very existence. It had a new dean. Bernie Gifford was a strong dean, so this was not a King-like person versed in the UC Berkeley tradition and simply coming forth knowing how to deal with the senate, et cetera, et cetera, et cetera. Bernie hadn't been at UC. [The] Senate was a new thing to Bernie. Bernie was trying to make a difference and make changes. He would ride pretty hard. There were places where I really had to play a role of helping interface that. I

remember another very interesting story about that. Bernie thought big, and he had a plan. He had written a ten-year plan for adding—I think it was something like ten or fifteen new faculty in various sub-fields of education. This was to accompany growth in the size of the school. It was unreal in the Berkeley sense, in that he was never going to get that amount of growth. Of course, he was in competition with all the other professional schools and colleges for that growth because of the process we would use for—all unfilled positions are collected into the chancellor's office, or, in those days, the provost for professional schools and colleges, and then they're put back out for new hires by a process, not at all necessarily in the place from whence they came. Because of that, all the deans of the professional schools and colleges were in competition with one another, or the schools themselves were.

So here's this meeting where Bernie had just completed his probably eighty-page academic plan document, asking for all these things. At the start of a meeting of the deans of professional schools and colleges, he very proudly came in with this big box and gives a copy of it to each dean. That was not something that made the other deans enthusiastic supporters of his plan. He was trying very hard, and he did some very important things within that school. I think it did make the sorts of changes that Mike Heyman was after in the difficult decision that he had made with regard to the school. So that was going on.

24-00:55:02

Rubens:

What's an example of how you interfaced, then? What would you do that would soften—

24-00:55:09

King:

It often would show up in dealings with the Budget Committee, because Bernie would submit a request for faculty allocations or for advancement of somebody or appointment of some new person. It collided rather than meshed well with our review system, and so it took a little playing of the organ to get it to work right.

24-00:55:34

Rubens:

We have five minutes on this tape so we'll break soon.

24-00:55:41

King:

Just some other issues specific to units. I can't structure them so as to say which ones were more important issues than others, but optometry had the issue of the optometry clinic, which, at that time, was sort of a clash with the rest of the campus, as it may still be today, because the optometry clinic is located on and within the campus. Here are all these people who come to it, and they occupy very valuable things, like parking spaces. So there was a cause of conflict. Optometry was interesting because it had a very distinguished research faculty, and yet also had this very, very practical frontline mission of running the

optometry clinic and having trained just about all the optometrists of this part of California. It was a school with a very dual mission. I'm not sure there are others I want to single out. However, one is public policy.

## Audio File 25

25-00:00:01

Rubens:

We are now trying to identify what were specific issues regarding some of the schools that you oversaw. One you wanted to talk about was public policy.

25-00:00:17

King:

Yes. It was, at that point, a fairly new school. Its history is that it was founded by Aaron Wildavsky and others and had been around not all that many years when I came in. It had been founded by economists. It was small in size and non-comprehensive of all of public policy because of the origins from so many economists. It was undertaking a process of trying to broaden itself to more dimensions of public policy and trying to grow. Trying to grow was a very difficult thing at Berkeley then and still is now, because of budgetary reasons and other factors. It is one where I really felt there was the most compelling argument for a need for growth. They asked for it. I was supportive of that in the review process for allocating faculty positions. They also, during my time, initiated a project for their new building, which has now come into fruition. That one was a very interesting project because their original building was a fraternity house.

25-00:01:37

Rubens:

Are you talking about the site where it is now? They had made a new building?

25-00:01:40

King:

Yes, they put a new building just west of the old fraternity house that was there originally.

25-00:01:45

Rubens:

The Tussman Program had been located there.

25-00:01:49

King:

That I didn't know. That tells you something about when public policy came into being. They would have had to succeed the Tussman Program. I think that is probably a very logical string of things in time. I didn't realize the Tussman Program had been there. Public policy was a need of trying to help with some really needed growth and broadening, which they've accomplished quite marvelously. It was one of my many dean searches, but we want to cover them together probably. Gene Smolensky is the one I hired. Absolutely delightful person.



25-00:02:30

Rubens:

Did you work with Aaron Wildavsky?

25-00:02:33

King:

I met and knew Aaron Wildavsky, but I never worked with him.

25-00:02:37

Rubens:

Vis-à-vis this policy.

25-00:02:40

King:

I worked with his son more, Ben Wildavsky, who was in charge of the U.S. News and World Report rankings of universities for some years, and is with the Kauffman Foundation now and has done a book on globalization of higher ed about a year or two ago. Anyhow, Public Policy was one [large need]. Another huge thing going on during my time, which was really a final phase of the reorganization of biology on this campus, was the reorganization of the College of Natural Resources. To go into that, one first has to realize that the college of natural resources is different of necessity in some very important ways. The first difference is that, because of the existence of the ag experiment station, and the fact that their appointments and research come in substantial measure from the ag experiment station, they tended to have eleven-month appointments rather than nine-month appointments. So summer salary was not an issue, and they had what amounted to one and a half months of summer salary by virtue of the eleven-month appointment.

Secondly, their research was internally funded. That's not really true for anything else in the university. Internally funded in that the Hatch Act funds and various other government funds would come to the vice president for ag and natural resources system-wide, and then there's the whole setup of the ag experiment station to divide those funds among faculty members, which is done in a fairly egalitarian way. It means they all had about the same amount of support. They had the summer salary that was built into their academic appointment, so they didn't have a need to get academic grants to get summer salary. Typically, the ag experiment station funds would give each faculty member at least one research assistantship. An interesting feature of that college was they had relatively little outside support and relatively modest-sized research groups. Whether it was that or the good old, possibly biased, academic value system, their appointment and promotion cases would have some trouble with the Budget Committee. It's not surprising. You've got a committee that's drawn from all the rest of campus, and the college for natural resources, in the ways that I've described, is so different from all the rest of the campus that they're going to have some difficulty in various things that are reviewed.

Anyhow, at that point in time, the college was going from what had been a variety of not-so-large departments into a transition that made many of these little things into one big department, which is called environmental science policy and management. Locked up in that were the fate of old-time disciplines, such as entomology, which has been a Berkeley discipline historically. We have the Essig Museum, which, if you like to look at bugs on pins, is a great place to go. They've sure got a lot of them. It also was where the School of Forestry was going. Forestry had been an independent school.

25-00:06:20

Rubens:

Very big, very important at one time. [ROHO has conducted a series of interviews on the history of UC's School of Forestry.]

25-00:06:22

King:

Yes. This raised the whole issue of Berkeley's future with regard to the profession of forestry. Would accreditation continue with this reorganization? Were the accrediting people from the profession going to want it to have a separate identity, as surely they would prefer? There were many issues and a significant amount of unhappiness associated with the formation of that department. The dean in those years was Will [William] Gardener, a distant cousin of David Gardner. Will had come from outside. He had not grown up within the college of natural resources, academically. He was looked upon as something of a disruptive threat by many in the college. There were a collection of issues there that took some careful dealing. Really, it was a matter of supporting and helping smooth the way for Will as he and others thought through this organization. The reorganization has now been in place for a number of years, and I think it's working quite well enough. I did, at the summer institute for my Center for Studies in Higher Education last week, have Keith Gilles, the present dean of that college, as one of the participants, and so had lots of chances to talk with him about what was going on.

25-00:07:57

Rubens:

Did he succeed Paul Ludden?

25-00:08:02

King:

I think there was somebody in between. My knowledge of the sequence of deans in these places does not remain good from 1994 onward, because I left at that point. The college of natural resources was a big one.

25-00:08:19

Rubens:

Let's clarify ESPM.

25-00:08:26

King:

Environmental Science Policy and Management. That is a big department. Probably something like eighty faculty. It was created

only in about the early nineties, from pieces that were all quite different.

25-00:08:50

Rubens:

Is it or is it not under the college of natural resources?

25-00:08:52

King:

Yes, it is. It's the biggest department in the college.

25-00:08:56

Rubens:

Isn't there a small program that is not—maybe it's a Ph.D.-only program—that is not underneath CNR? I think it reports directly to the vice chancellor.

25-00:09:08

King:

You are thinking of the Energy and Resource Group [ERG], I'll bet. That was indeed separate in my day. That was an interesting one. That is what is called an augmented graduate group. The campus has these graduate groups that are composed of faculty typically from different departments, who get together to use what is almost always existing resources, existing courses, et cetera, to compose a master's or a Ph.D. in a particular different field. I was involved with a graduate group on food science and engineering back in my days in chemical engineering, but there are a large number on campus. I think it's maybe something like fifty or sixty. Occasionally, some budget is given to one of these graduate groups. In the case of the energy and resources group, a lot of budget was given to them. We had hired John Holdren, who was a physicist from Harvard who was interested in the broad energy, environment, and social issues that had hatched in the seventies. Holdren, being highly interdisciplinary, wanted a structure that stressed that interdisciplinary aspect. The energy and resources group had something like four faculty FTE, to which they appointed their own faculty or shared appointments with another unit, and then something like forty or fifty affiliated faculty from other departments on campus. This stood outside of any school or college, and therefore it was my fourteenth report. It also had the interesting feature that none of the core faculty were the chair. The chair had to come from among the affiliated faculty. One such chair in my day was Bob Sawyer, a mechanical engineering professor who later became head of the Air Resources Board in the state environmental department.

It was a very special structure. I, as a novice provost, had the idea that you'll be better served by having a dean who can speak for you and for your needs; why don't we put you in with the college of natural resources? You never heard a more negative reaction than I got to that. They are now in the college of natural resources, but I didn't do it. It happened not many years ago, and they are now a program within natural resources under Keith Gilles. This was many years after

Holdren left and went off to the Harvard Kennedy School. He, of course, is now the presidential science advisor.

25-00:12:22

Rubens: So the resistance and opposition to your proposal was part of Berkeley culture?

25-00:12:30

King: The opposition was that ERG, Energy and Resource Group, thought itself very different and of an intellectually very high caliber. From that point of view, the college of natural resources would be, A, too pedestrian a place, and B, something that would limit what they could do.

25-00:12:56

Rubens: I guess what I'm trying to get at is that possibly, by fiat, you could have moved them?

25-00:13:03

King: No, not by fiat.

25-00:13:05

Rubens: Because of the Academic Senate.

25-00:13:07

King: Yes. I would have had to consult and have people on board. It would have been a big project to get that done. I became convinced that that wasn't the thing to do. I think it's the departure of John Holdren that made the difference, because he was such a figure within that unit and had such strong feelings as to how things should be done. What I would have succeeded in doing, if I had tried to do that, was to put Holdren off to Harvard ten years before he went to Harvard.

25-00:13:42

Rubens: You think that's enough on natural resources?

25-00:13:44

King: Yes. Very interesting situation, though.

25-00:13:47

Rubens: Yes, fascinating. The evaluation of the biological sciences, had that started under Rod Park?

25-00:13:57

King: Yes. That had gone very far down the road before I came in as provost. I, in effect, picked up the agreed plan that was in place. The agreed plan put plant biology within the college of natural resources. That was formed of a collection of people who had been every which place beforehand, and so that is another department of the college of natural resources. That was interesting and it does deserve some comment,

because the people in plant biology, by and large, came out of letters and science, and therefore had nine-month appointments. [They] Did not have eleven-month appointments, did not have agricultural research station funds, and therefore were an entirely different breed of faculty. There was some cultural adaptation that had to go on there, too, as they were put into that college.

25-00:14:58

Rubens:

That's your tinkering. What about the library school?

25-00:15:04

King:

Oh, what about it? In my day, and I guess we still do, we had four quite small professional schools. One was journalism. Another was public policy. Another was social welfare. The fourth was the school of library and information studies. Historically, that was the library school. It trained librarians. I had known very little about it before getting into that provost position. I did know there was something within the library called the Library School Library, and I thought that was a strange name. That was, of course, the library of that professional school. I arrived and the library school was already under quite a bit of intense review from the system. It came about because of the system of regular reviews by the graduate division process. Some of them had found very major issues that they thought needed to be worked on, sufficiently so, so that Doris Calloway, as one of her last acts, had appointed someone who was not of the library school faculty as their dean. That was Bob Berring, who was, at that time, also law school librarian, but a member of the law school faculty. Berring met with me a few times and I visited the school. Then I had a visitation from senior members of the faculty who were of the old-time library school. They wanted to tell me that Berring wasn't really the dean, that he was an acting dean, and that they were supposed to have a dean search. It had been quite clearly said that he would be an acting dean. Well, that was strange, since she [Doris Calloway] didn't use the title "acting dean." So what should be my next stop? It would be either Berring or Doris Calloway. I decided I'd go to Doris Calloway next and say, "What is this?" She said, "Oh, yeah, they may have said that, and they will say things like that, but he's the real dean."

25-00:17:25

Rubens:

Was that unusual, though, for a dean to be pulled from another—

25-00:17:28

King:

Of course. Very unusual. Here I had the faculty believing that he was an acting dean. Here I had Doris Calloway telling me he was permanent. So I went to Bob Berring and asked him what he thought he was, and he said he thought he was there for a while, but this wasn't going to be his new career. So, well, okay, that's interesting. That sort of sets the stage of what are the issues at play here. The reviews had to

do with such things as whether there was real scholarship to be had in the field of libraries, studying libraries. The reviews had another troubling factor, which is that the school had the ladder rank faculty of the school, and then it had a number of people with lecturer-like positions. It had been noted in the reviews that the ladder rank faculty were teaching specialized advanced courses, and what few undergraduate courses there were, plus the professional program, was being taught, to a very substantial extent, by the lecturers. That wasn't right.

I worked with the Budget Committee. We of course came to what, in hindsight, is the easiest decision of all to make, which is to have another committee look into the school and really examine it inside-out. Bob Oliver was my chair of that committee. He was a longtime professor of industrial engineering and operations research here. A good friend. A good friend since then. I didn't know him that well when we went into this. He chaired a committee that looked at the school and came to a conclusion that there had to be radical change, that just continuing what was there was not right. Also at that time, the Berkeley campus had set up a new sort of experiment in campus governance, where there was something called the academic planning council. The academic planning council was a joint body of the administration and the senate. Equal membership, roughly, from both bodies. So this was an academic planning council issue.

25-00:20:06

Rubens:

How much power did that council have?

25-00:20:11

King:

With the way the issue arrived to them, it had total power in the sense that it had to take on that issue, decide something and recommend it, and now look at what is the membership of that academic planning council. John Heilbron, who was TVC, was on it. I was on it. Carol Christ was on it. The chair of the Berkeley division of the Academic Senate, the vice chair, and the chairs of major committees of the Academic Senate. That body is, in itself, something interesting, because it's a way to try to get fast-moving and much discussion issues taken care of—issues needing much discussion—get them taken care of in a way that isn't exactly the usual arms-length relationship between the administration and the senate, where you might actually write memos back and forth between the senate and the administration. This was an effort to put in something that would preserve the role of the senate and that structure, but enable the two bodies to dig into things in more depth together, and hopefully move forward in a better way to a solution.

25-00:21:36

Rubens:

Did this come about during the period you were provost?

25-00:21:38

King:

It came about, I believe, with the arrival of John Heilbron as TVC, which would have been very soon after the arrival of Chang-Lin Tien as chancellor. We haven't talked about the differences between Heyman and Tien, but we should, because that has to do with why this came about, too. But here it was, the principal planning body at the time on the Berkeley campus, and here was this issue of a whole lot of orderly and structured reviews having been done, recommending that a school had to undergo major change or elimination. The academic planning council decided to address this by having another committee, a special committee on the library school, to recommend the solution to all of this, with the provost of professional schools and colleges as chair, and with a committee membership that I also very largely appointed. There's a very easy way to look and see who that membership was, because this whole process now has the status of being the review that is treated as the example case study review on the website of Cathy Koshland's office, the vice provost for facilities planning and undergraduate instruction. What the process was and how it functioned is there on that website. Then, interestingly, when you go to the website of the school of information, on their website is our report, which includes the names on the committee. I looked at that recently, so I do remember who they were. Gene Smolensky was somebody I put on there as a wise hand.

25-00:23:45

Rubens:

He came from where?

25-00:23:46

King:

He was the dean of the school of public policy. We had Robert Wilensky, who was chair of the computer science division within EECS, electrical engineering computer science, on campus. We had some people from the library school. We had Michael Buckland, who was sort of the grand, longstanding figure within the school, who had also had a period being in charge of libraries as part of the office of the president administration years before. We had Nancy Van House, who was the acting dean of the school at that time, and who represented some of the older end of the library school, but also a more social science-based approach. We had Charlotte Nolan, who was a person involved in the practical training of librarians, who was a lecturer but also an associate dean of the school. There are some more from outside [the school] that we'll find if we look at the list of who was on that group.

Now, finally, that committee had to deliberate, recommend something, and I had to work, knowing that the something that we recommended was likely to pass the academic planning council, which was no mean feat. There were people there who very much wanted the elimination of the school and that's it, and there were others who didn't see it that

way and supported the school. Of course, there was a large amount of support for the school, because another thing that happened as all of this went on is that the chancellor's office and the office of various legislators and the governor accumulated a stack about this high [one foot] of letters from just about every librarian in the state that had been sent off, trying to preserve the school. It was a public issue as it went on, too, and the regents had become aware of it. So there it was.

As we deliberated, the problem we encountered is that, to have a troubled school that is training librarians, per se, doesn't look much like Berkeley. Just librarians, per se. Yet here we are, entering the information age, and this was 1992 and '93 that we were doing this—'94 also. Here we are, entering the information age, and it's going to do nothing but grow. There are commonalities to the use of information technology for social purposes. There's the making of a new professional field here. To give us some more encouragement on that, the University of Michigan had just taken its school of information and library studies, which had been another traditional old library school, and it appointed an electrical engineer as its dean, Dan Atkins, who's gone on to many things since then, including being prominent in the National Science Foundation. So there was a school that had tried to move in a very different direction. Yet if we believed that there was going to be this new profession and this new field, and it was going to do nothing but grow in importance, to what professional society would these faculty belong? Where is the profession elsewhere in the country? Could we lead in the formation of a profession? All of those issues come together in the report of that committee, which, in order to find the path that would get through the academic planning council and the rest of the administration well enough, we actually recommended the abolition of the school of library and information studies, and the formation of a new school of information management and systems. I may have said before, that has now shortened its name to school of information.

I left for the office of the president as that decision was made, as it had gone through the academic planning council and been accepted and been enacted. The issue of what to do with the existing faculty was to be addressed, but had not been addressed in the individual circumstances when I left. That did have some difficult features to it. The hiring of the new dean happened after I left, and the hiring of the other founding faculty of the new school occurred very soon after I left, but I followed it. I think the plan was followed very, very well. I think we had a good plan. I am glad it is the example document on these websites. The first dean hired was Hal Varian, who was a very prominent economist of information from the University of Michigan. It is interesting that we took him away from Michigan, which was the other school thinking of going in this direction. Hal did well as dean.



He is now the chief scientist of Google, down in Mountain View, so he's found other interesting things to do.

25-00:29:40

Rubens:

More remunerative.

25-00:29:42

King:

His successor as dean is AnnaLee Saxenian, who I know well, who was hired, actually, in city and regional planning while I was provost for professional schools, and who joins me on the board of the American University of Armenia, when we get to that subject. I think they've both done a good job of building the school. The faculty hired—there were some people whose background is indeed computer science. There's Pam Samuelson, who is a lawyer and a law professor, and a joint appointee between that school and the law school. Very good national stature. Her expertise is intellectual property and copyright. And some sociologist appointments. It's a real collection of different disciplines, and I think it is an example of how one can address something that is inherently interdisciplinary through the mechanism of professional school. I think it's been quite successful. It's not the only model for doing things interdisciplinary in a university, and it can't be, because as you form interdisciplinary areas, some will work, some will not. They have to have fluidity, phase in, phase out. To give it the rigidity of structure of a professional school, which you can do only once in so many blue moons, can't be your most common weapon. But it was a good method for doing it.

25-00:31:25

Rubens:

Was there money allocated for this?

25-00:31:30

King:

I think some startup monies were given to the school upon recruitment of the dean, and a certain number of faculty positions were given to the dean to recruit. So yes, some money, in those two ways. Then there was the matter of the existing faculty. I believe all but one were put in the new school. I believe there are only two who have not retired at this point. There may be a third one. The one faculty member who did not get put in the school got put in another department. It didn't cost the faculty their jobs.

25-00:32:29

Rubens:

We'll talk about environmental design under—

25-00:32:33

King:

Let me add one more comment on the library school. I really regard that as one of the accomplishments during my career that I am proudest of. However we did it, we defined the right new field, and also just all that had to be dealt with, bases touched, strong feelings

taken into account, et cetera, to steer that through to success was pleasing to me.

25-00:33:04

Rubens:

It seems that your scientific categorizing, the kinds of mental discipline that you had, served very well.

25-00:33:17

King:

Well, yes. This comes also from being a breed of engineer also. We're problem-solvers. That's how we're trained. If there is one thing that has been common throughout the various administrative things I've done in my career, it is taking poorly structured, not completely understood, exceedingly complicated situations and breaking them down into manageable-sized pieces and how they fit together in coming up with a solution, and then working the system to get through to where that solution is adopted and will work.

25-00:33:57

Rubens:

You must have learned a tremendous amount. I would think that would be just fascinating, looking at—

25-00:34:02

King:

I enjoy that. That is why I've done this.

25-00:34:08

Rubens:

You said that the Michigan program was headed by an engineer.

25-00:34:14

King:

An electrical engineer. That's a close relative of a computer scientist. There's also a field called computer engineering. His disciplinary background was important for defining what they were trying to do at Michigan. My disciplinary background didn't have much to do with defining, but my committee members had good disciplinary backgrounds.

25-00:34:38

Rubens:

There had been a big conflict here in engineering versus—

25-00:34:42

King:

Yes, that's another story I wasn't involved in at all. Where computer science would go at Berkeley. It existed in two pieces originally.

25-00:34:52

Rubens:

Let's talk about particular dean searches, then, and reviews.

25-00:34:58

King:

With thirteen deans and one energy and resources group chair, and five-year reviews of any sitting dean, if any dean wishes to continue, you can do the mathematics on that one. At all times, I have at least one dean search, probably two, and/or dean reviews going on. That

was absolutely fascinating. I think that was an important aspect of this provost for professional schools and colleges position, was that you would have enough knowledge of what professions were about and what they needed so that you had an extra something going into a dean search. Although it, like all other things at this university, is a process that involved many different people so no one person dominates it, nonetheless the provost plays a huge role in getting deans, because, first of all, working with nominations from the senate and your own ideas, you compose the committee that's going to be the search committee, which does a lot of the defining right there. Then that committee must give you multiple recommendations. It's always the rule. They can't give you just one name. They have to give you more than one name, and then whatever verbiage and prose they want to accompany all of that. There was a decision to be made every time one of these came forward, and then I would work with the advice of the Budget Committee, what they had to say as their thoughts to that decision. That's one where we had more freedom. Then, of course, I would work with the chancellor and the TVC, The Vice Chancellor, with regard to what I want to do, but I was really the focal point of the process and the one determining what went on. It was probably the most important thing I had to do, was picking these people. I did a lot of them. Some were ongoing when I came in. The search that led to Gene Smolensky was that. I ended up then needing to be the one to hire Gene and find out what his needs and desires were and fit them into our system, see if we could do whatever that was. That's one that was a particularly crucial hire. That was public policy, and that had had acting deans for several years, because that search was a long search. It didn't reach fruition right away. It was important to get a stabilizing dean and the right dean in there.

I did one in journalism. The original deans of journalism had been founders of that school. They had been there from day one. Ed Bayley had been the original, and then Ben Bagdikian was dean for my first one or two years. We had to search for a new dean. That's when Tom Goldstein was appointed. That, again, I think, was a non-obvious choice, but a very good choice. He did much with regard to building that school within the profession. They all, to various degrees, had external advisory boards. We've talked about advisory boards, but the one Tom Goldstein got for the school of journalism was people right at the top of the profession, and very, very effective. I remember I would often go to the meetings of that board. They wanted me at each meeting. This is not on the subject matter, but I remember going to one on a Saturday morning. They typically worked on a Saturday. Coming back from that meeting, I had gone to downtown Berkeley and then was coming back on campus in my Chevy Blazer vehicle at the time. A car, driven by a student, blazed through a red light on Oxford Street and smashed into my rear end, turned my car over. Instead of going

back to campus, I ended up at Alta Bates Hospital, being pushed and pulled in all directions, but nothing wrong with me. They couldn't understand why there was nothing wrong with me. Rather traumatic event. That's how I remember that the journalism board met on Saturdays. His board was excellent. He also organized that school well and made some excellent faculty hires. He went out and got people like Susan Rasky, who was a practicing reporter. No faculty member at all by background. Bill Drummond was another one of his hires in radio. Then he was just building TV at the time as a separate component of the school. That was interesting. I never did a dean search in social welfare, because Harry Specht was there the whole time. I did one in law, and I did one in business, and I did one in engineering.

25-00:40:26

Rubens:

And environmental design.

25-00:40:28

King:

And environmental design, thank you, and probably more. I did public health, of course, too. That list is still not over. I did others. I did one in education, for a successor to Bernie Gifford, too. Let's talk law and business. Law, I had to get a good search committee. Jesse Choper had been dean for something like ten years. They were open for a new dean. It was time for a new dean. It was not clear what would be done here. Picking that search committee was very important because the law school has a tradition of, we will govern ourselves, thank you very much, go away. So who could be a committee chair, and who should be on the committee to deal with that sort of situation? The committee chair I remember coming up with was the one and the same Tom Goldstein, because he has a law degree. His research has been on the intersection of law and journalism and on journalistic ethics. He was the chair. That committee went through a search. It was also a tense time within the school because of the play out over the years of what I had mentioned about the issue that landed on my desk on my first day. That was when we picked Herma Kay as dean, a longtime Berkeley faculty member. Very well-known on campus.

25-00:42:12

Rubens:

I think the second woman hired at the law school.

25-00:42:16

King:

Yes, and certainly the first woman dean. So here was the first woman dean of the law school. Herma and I worked together very, very well during her time. I liked working with her. I even went to a conference in Chicago, which was a conference of law deans. Every dean, bring your provost. Pairs of deans and provosts went. That was quite fascinating. I learned a lot about law as a discipline then. So that was one. Business was an interesting one, because business had always

been internal deans, and academic deans, if you will. The business school had, inside itself, sort of come to the conclusion that they needed to make a splash on the national scene with somebody who is very prominent in business and who represented the profession rather than being just an academic. There was a complex search there, and it ended up with the hiring of Bill Hasler, who had been a partner with one of the big five accounting firms, and not a professor of business, before he came. His appointment started off with the issue of, he should have a faculty appointment. What will that appointment be? What, you want to appoint a professor who has no publications? So he was a professor-in-residence. These other titles become useful at various times. Bill was a very different dean of business. I also had the pleasure of hiring Budd Cheit for what must have been his third stint as dean of business for the interim between Ray Miles, who had been the previous dean, until when Hasler could start. I worked some with Budd there. Budd is a dear friend, too.

25-00:44:11

Rubens:

Why is it the Cheit Building?

25-00:44:14

King:

It's named for him.

25-00:44:15

Rubens:

Did people give money for the building to honor him?

25-00:44:17

King:

Yes, it's a private building. The business project was entirely privately funded. There's no state dollar in it. Business was, of course, extremely practiced at doing good, large-scale development work. There were many graduates. Budd is a very, very well-recognized teacher, and very respected. There are many graduates of the school of business who thought, this would be wonderful; let's name one of these three buildings for Budd Cheit. So they did. Environmental design, you mentioned and I should mention. That was a dean selection process that we came up against. Dick Bender had been dean for a very long time. A different sort of dean for the school of environmental design. He is an engineer by his training. It was an architectural engineer who had been the dean for quite some time. They're ready for a turnover. We do a recruitment. Like nearly all of these recruitments, it looks both outside and inside. We come up with finalists from this recruitment. The two finalists are a very distinguished practicing architect and Roger Montgomery, who is actually from a split appointment within that college. Really, primarily, he was city and regional planning, but I think he had another 50 or possibly 30 percent of his appointment in architecture as well. This would be a very different sort of dean for the school of environmental design, which had had pretty much straight

architectural people before, with Bender being the furthest they had departed from this.

Perhaps there was some play of the college of chemistry situation in that, where I had the ability to recognize the status and role and dynamics surrounding the smaller departments in the college. [A College with] A few departments that also has a big and very distinguished department. Architecture being that, and chemistry being that in my own college. In any event, we went with the choice of Roger Montgomery. He also was a person with very strong interests in undergraduate education. He had done things like BOARS, the board on admissions and relations with schools, a big system-wide senate committee. Roger also had a strong interest in undergraduate education in that college. I think that was timely to have him and those interests in there, too. That's another one I did. There are many others. I remember replacing Joyce Lashof, who ended her time as dean as public health, and hiring Patricia Buffler as the dean there. That was during my time.

25-00:47:31

Rubens:

Was she distinguished, Buffler?

25-00:47:33

King:

Buffler came from the University of Texas system, as I recall, so she was an outside hire. Again, that was a search that looked at internal and external. Indeed, that was a search that came down to a choice between an internal and an external, which is a difficult kind of decision to make. We've had external people become deans of our professional schools, of order, half the time. Engineering and chemistry don't do it, but others have.

25-00:48:06

Rubens:

Did the dean of the business school, Hasler—was he a successful appointment?

25-00:48:17

King:

For Business, you don't just look at the person as a dean. You look at what the business school thinks is the need of the time, and that's going to change at five, ten-year intervals. Hasler's successor may have been Tom Campbell. I think it was. There's yet another something. Tom Campbell is out of the state government and the U.S. House of Representatives. That was felt to be an imposing, splashy appointment at the time.

25-00:49:03

Rubens:

Is that right?

25-00:49:03

King:

Well, of course. Campbell became Arnold Schwarzenegger's first director of finance, statewide, state government. Campbell took leave to do that, and a fellow named Rich Lyons was made dean. The feeling was they did want an academic at that point, and Rich is dean, and I think very successful at that now. My point here is that seemed to be a place where you look at whether the needs of the times are academic or associated with the business world itself. Those change. I contrast that with engineering and chemistry, where I never see those issues coming up. The interest will be to have somebody internal. It would be a big, big deal to bring somebody from outside as dean of one of

25-00:50:15

Rubens:

I have a series of questions I want to ask you, but the one other thing on your list was reviews.

25-00:50:24

King:

Reviews and building committees. I don't think there's much else to be said on reviews. The whole thing is epitomized by the library and information story.

25-00:50:39

Rubens:

I have a few left-over questions. Were there people who chaired the budget committee, or people at the Academic Senate, that you particularly worked with or had some observations about?

25-00:50:54

King:

It was a different person every year, and I was in that post for seven years. Therefore, there were seven of them. One of these, rather late in the game, was Nick Jewell. Nick Jewell, who's out of biostatistics, and is a professor thereby in both public health and the department of statistics in L&S, I think had just done the budget committee, either my last year or the year before. When I left the position of provost for professional schools and colleges, the campus reorganized. I was the last provost for professional schools and colleges. They went to another organization, and what they did was to collapse the three positions. Tien had a strong desire to downsize his senior administration, and so they collapsed the three positions of The Vice Chancellor, provost and dean of L&S, and professional schools and colleges provost into two positions, which were what is now called executive vice chancellor and provost, and then a deputy—I think it's deputy—provost. Maybe associate. No, it's vice provost. Nick went into that position. Then the dean of L&S became simply the dean of L&S, and at the same time, L&S became four separate deans, plus an undergraduate dean for L&S, plus one of the four separate deans being the convener of deans, and thereby dean of L&S. That's a way different position from what Len Kuhi and Carol Christ were in in my time.

25-00:52:53

Rubens:

Maybe we're going to get to that with Tien. Was that reorganization and the study for that reorganization underway?

25-00:53:01

King:

No, it was just simply done. It took advantage of the fact that I was moving on to the office of the president and that John Heilbron took early retirement. It can't have been one of the VERIPs because the senior figures were not eligible for VERIPs. John Heilbron, in any event, just simply retired. That's what he did. Took an early retirement. He was a very interesting figure. John is worth talking some about, too. I just received my Yale alumni magazine and I discovered that he got an honorary degree from Yale this last spring. That's unusual for a Berkeley administrator.

25-00:53:47

Rubens:

Maybe we should talk about him right now. I was asking you about budget committee heads that particularly were creative or—

25-00:53:53

King:

Nick is one. It was different people every year, and I'm going to have a very hard time remembering all that many of the names. It was an intense working relationship with the Budget Committee. It was two things. It was all of the personnel cases, and then it was the process by which we determined how we were going to allocate the available faculty positions back to the units. Maybe we'll talk about that one first. The policy here at Berkeley is that if a faculty position opens up because of a resignation, death, or retirement, that position reverts to the chancellor's office. Then the chancellor's office makes a decision of how many of those to reallocate. In my day and time, there was also an early decision made how to apportion these between professional schools and colleges and L&S, because two different provosts were dealing with all that. I would receive the advice of the Budget Committee on the allocation of the positions. I would say the advice of the Budget Committee on personnel cases is almost always advice with a very large capital "A." That is, it determines the outcome. Less so for the allocation of these faculty positions. There's more of an administration role there, but the senate role is still strong. I would do a lot of meeting with and talking with the Budget Committee, both on the faculty position allocation and on the personnel cases.

The process is kind of interesting. When a personnel case is reviewed by the Budget Committee, they write what they call a minute. The minute is sent to the provost. My inbox would be blue folders about this [an inch] thick, with personnel cases in them, and then clipped to the front, the minute. I read the minute. Do I agree? If I agree, that's fine. Initial it, send it off for action. If I think there's a problem, I first consider writing something back to the Budget Committee. That would



sometimes be, I think the sum of the evidence is in the other direction of what you recommend. It would also be things like, have you considered this? Have you considered that? I think there's something else within the file that we should be looking at. With that, the Budget Committee will re-review the case, and a new minute comes. I've got the old minute and the new minute. I look at the new minute. If that still bothers me, then I'm contemplating going against the advice of the Budget Committee. At that point, I better sign up the vice chancellor, and, if it's a tenure case, the chancellor, to my point of view. That would be the next step, if needed. Then I go back to the Budget Committee and say, I'm inclined to disagree—this is all the accepted protocol—because of this, that, and the other thing. Then they have a chance to change their minds again. If they don't, I go and meet with the Budget Committee for forty-five minutes or an hour on this particular case. If it's a tenure case, where we're thinking of going in the other direction, I've got the chancellor with me, and, of course, fully signed-up to my point of view before you get him into that.

That was all the process for the tenure cases. The Budget Committee does write an annual report, which is published in the things that are sent out to all faculty members on campus. Typically, the last paragraph or line of that report is how many cases of disagreement there have been in a given year. That's going to be a number like three or four for the whole campus. It's a very small number. Very often, we appreciate and go with the Budget Committee's point of view. Nearly always. I do remember one case, and you'll be able to see why it sticks in my mind, which was a tenure case. I decided, this one's more against the nature of the unit rather than against the individual that they're making a recommendation of denial. I actually think the person has done pretty well. So I went through step one. Have you considered blah, blah, and blah? Back comes the second one, saying, yes, we have considered that, and we still recommend against tenure. So I went and I signed up the necessary higher-ups, sort of lukewarmly, to my point of view. I sent something back to the Budget Committee, and I said, "I'm still inclined to go the other way, so I think we better schedule a time to meet." We scheduled a time to meet and I went down there. These sessions would always be the Budget Committee being of one mind. They obviously hadn't been of one mind, but by the time they're talking to the provost, they're of one mind. The chair of the Budget Committee says, "Provost King, I think this is going to be a rather short meeting. We've decided we agree with you after all." Out of all the however many cases it was—it was hundreds and hundreds and maybe even a thousand. Probably was a thousand during all of my time. That one sticks in my mind as being one where I actually persuaded the Budget Committee to go in the other direction.

25-01:00:04

Rubens:

I was just wondering if there were any particular faculty that stood out in your mind as being adept at—

25-01:00:12

King:

No. You can't separate the budget committee from one another. They're going to be together. I think all chairs of the budget committee have a very tough and challenging management job. That's no easy position. Therefore, another form of your question could be, if I think they all did very well on the job, could I single out somebody who I think didn't do so well on the job, and I can't do that. All seven of them were good.

25-01:00:52

Rubens:

You don't take that position if you're not pretty—

25-01:00:56

King:

You're put there, I believe—I don't know how you're put there as Chair of the Budget Committee. It's either by the vote of the nine members, or it's by the committee on committees, or it's by some combination. The person will have functioned on the budget committee for two years before they're put in this post, so they've been seen.

## Audio File 26

26-00:00:02

Rubens:

Your work schedule must have been—what time of day did you start?

26-00:00:27

King:

I think if I've held a trump card, it has been the ability to be organized and also keep going a lot of times. The other thing to realize is that during all of this, I still had research going on, and teaching going on. When I was provost for professional schools and colleges, my only teaching was freshman seminars, but that's because we had just started the program, and I was there at the time we started the program. Here we're going to ask a whole lot of Berkeley faculty to teach one and two-unit freshman seminars as overload without taking it into account in their other teaching schedules. If I'm going to do that, I'd better teach one, too. I did. I taught one on chemicals and the environment. It was a ton of fun. Very enjoyable. I may have mentioned this before, but one of my last Ph.D. students is now married to one of my freshman seminar students. They're both at Proctor and Gamble. She had been interested in some L&S major and became interested in chemistry. I think she is a chemical engineer, chemical engineering, I like to think as a result of that seminar. Then the two got married, and they're both reasonably well up in Proctor and Gamble in Cincinnati.

26-00:02:09

Rubens: He was the teaching assistant with you?

26-00:02:11

King: No, he was my Ph.D. student—research student. John Hecht is his name, and {Stacey Cowan?} is his wife.

26-00:02:17

Rubens: But met because of the seminar? That's why I was just wondering if he was assisting you with it.

26-00:02:23

King: I know both of them because he was my student and she was in my seminar. The third leg of the triangle as the two got to know one another in the college of chemistry. I'm not the broker, not the marriage-maker.

26-00:02:41

Rubens: Your work schedule, though. So you are organized—

26-00:02:44

King: I have always put in long hours. In those days, I would work evenings at home, as well as daytime, and a substantial amount on the weekend, too. I can no longer do that, but I did in those days, and that's the only way I could keep a big job like that, plus a whole professional career. With the research also came the need to go to the national meetings on this and that, and the various other organizations that we've talked about. I think I've had an ability to think of all the hundred things I might be doing next, and pick out the one that I most need to do next, and plot the next three or four things down the road, and be organized that way. There was one interesting feature of that provost job, though, the professional schools and colleges one. It was so heavy on the personnel cases that that was the single largest consumer of time. Those I could not take home. They are confidential dossiers, and the Budget Committee minute and all of that. It was before the time of computers. You couldn't take it home by computer either. Just this year, I understand, the personnel system has gotten to where all the entire case for somebody undergoing an advancement review will be computerized and will be accessible by a password protection from wherever the reviewer is. That, of course, would, for me, be the best of all worlds, would be to be sitting over in Mammoth Lakes, hiking around in the mountains and coming home to look at the day's personnel cases.

26-00:04:32

Rubens: Maybe it would sully the experience.

26-00:04:34

King: It would sully the Mammoth Lakes part, but it would certainly make the case part more interesting.

26-00:04:43

Rubens: Did the Goldman money come in for the—

26-00:04:46

King: No, that's after my time.

26-00:04:47

Rubens: Did you particularly also work with PR people here?

26-00:04:58

King: Oh, yes, indeed.

26-00:05:03

Rubens: You had to manage certain issues.

26-00:05:05

King: This would come about in various ways, such as the nuclear reactor or whatever was having its play in the newspapers. I do remember a day of going to how-to-deal-with-reporters school.

26-00:05:22

Rubens: With Ray Colvig?

26-00:05:25

King: It wasn't Ray. Ray was gone before I got there. The one who put me through the school was Marie Felde, as one of her first assignments here.

26-00:05:40

Rubens: I was shocked when I learned that she was gone. So there were certain issues, some of which we've talked about, that you had to manage.

26-00:05:49

King: Oh, yes, but nowhere near as much as I encountered in Oakland at UCOP. Oakland was full of that.

26-00:06:07

Rubens: Did you want to say something more about John Heilbron?

26-00:06:12

King: Yes, and Chang-Lin Tien. I believe I've talked about Mike and Rod in the past. One interesting thing about the jobs that I've had has been that I have worked with a number of different people who were in a CEO position. Mike was one. Chang-Lin Tien was then another. Walter Massey—well, that wasn't CEO, but that was pretty close to it—was another. Jack Peltason for a while. Dick Atkinson for a long while, and Bob Dynes for a little while. One striking thing is that there's no single set of mannerisms or MO for a CEO. They are all different. One of the most challenging things for the jobs I have been in is finding what I should do and how I should try to adjust or adapt

myself to fit the nature and the needs of this other person. That involves some tuning.

Tien and Heyman. Heyman had his own academic vision for the campus—as best I could tell, developed jointly with Rod Park. In The provost position, the years I worked with the two of them, it was clear you, the provost, or the other provost, were not making major campus policy. That impinged on Heyman and Park. That did change with Tien and Heilbron for a couple of reasons. One is that Chang-Lin Tien liked to engage himself in the outside things heavily, didn't have strong views or feelings about things inside the university, epitomized, if you will, in a day when we had somebody from the state government visiting us. I had come up to his office for a meeting. The subject of one of the professional schools came up. Let's say it was college of natural resources. It may have been. He turned to me and said, "Yes, what is our policy on the college of natural resources?" It was interesting that I was, in that episode and in a number of others, in the position of being much more of a determinant as to what our policy would be on various internal things. Chang-Lin looked outside the campus more than inside.

Now, John Heilbron came from a heavily academic background. He is a scholar of the first order. He's a very unusual scholar because he's trained as a physicist, and yet what he does is not science. It's history, history of science. He's the author of all sorts of things. A very good history of Lawrence and his lab. Also, after my time of dealing with him, when he took that retirement, he then translocated himself to Oxford, and since has lived primarily in Oxford. I noticed a few years ago that one of his books was based on having gone around to the cathedrals of Europe and having measured the angles at which the light came into the various windows and other openings of the cathedral, and what that must all have meant and what it pertained to. I thought that was fascinating. All that he does is very respected scholarship. He may have been chair of the history department, but he had never been in any kind of major administrative post. He had had prominent senate positions. He came in with a very contemplative approach. I think he found it difficult to have as many different issues per hour flying at him as there are within a chancellor's office. He was one with strong views relating to the library school issue that we have discussed. He also left me, and I think Carol Christ, in the position of determining internal policy to a large extent. John had just certain things that he cared about quite strongly. He was very thoughtful on them, and very good academic judgment, but he would focus on those things. He wouldn't cover the whole gamut, which left the gamut for the provost. It was a very different sort of thing, and I found myself in a much more self-determined job during those years after that new administration came in. It's interesting. I think it's just the styles of

people. They all put in strong effort. They all have strengths. They all have things they feel they do well and they want to do. The issue for the next person in line is, they are as they are, they cover what they do, they're good at what they do, et cetera; what now do I do? So you have to keep redefining yourself every time you get a new person you're working with.

26-00:12:14

Rubens:

Tien appointed Heilbron. What do you think Tien was looking for.

26-00:12:17

King:

I believe Tien was looking for somebody from the other parts of the campus. Remember, Tien, too, was an engineer. I believe that he wanted the solidarity with the Academic Senate that that appointment would create.

26-00:12:38

Rubens:

Another thing I heard about Tien is that he came to work very early.

26-00:12:44

King:

Oh, yes, and stayed late.

26-00:12:46

Rubens:

Also that his desk was cleared. That he didn't have stuff on his desk.

26-00:12:51

King:

His desk was always pretty clear, yes. Mine has little stacks of those things that I better be doing, and I better know whether they need to be looked at. I will raise my right hand and say that my desk is organized, but it's certainly not clear. I remember another story about Tien. We would, of course, go to all sorts of events at University House. The chancellor entertains many nights a week. Quite a few times, the provost would be part of that. I remember once something ended at ten o'clock, and I had walked out of University Hall. As was my wont, I had parked in the morning over in the Dwinelle Hall parking lot, which was, at that time, the nearest one to California Hall. I'm going back to my car. Maybe Jeanne and I are going back to my car—or to our cars, because she would drive in separately and park in that same lot after five o'clock, so as to get a space. We're walking back to our cars, and here's a light on in the chancellor's office on the second floor corner of California Hall. The event is over no more than ten minutes. Here's this light, and he's back in his office. He had long working hours.

26-00:14:15

Rubens:

Did you get a parking place because of being provost?

26-00:14:19

King: Oh, no. Oh, no, no, no, no.

26-00:14:22

Rubens: Nobel laureates, maybe.

26-00:14:24

King: Nobel laureates, yes. Dean of the college of chemistry, yes, because there were unit-based parking slots. We had way more parking around the college of chemistry when I was dean than we do now. Tan Hall knocked out about forty parking spaces. No, I didn't have an assigned one as provost. That (the Dwinelle parking lot) was a good lot in that it was the closest one to California Hall.

26-00:14:54

Rubens: Regarding Tien, it seems to me that he was quite intent on making the campus a friendlier place –putting in more lights, setting up booths where students could come to ask questions.

26-00:15:25

King: He had some other characteristics. One was that he would walk across campus. In fact, he'd go out for a walk an hour or so every day. Not a bad idea, by the way. He would be talking all the time with students. He was known to the undergraduate students, I think, much more than any other chancellor would be.

26-00:15:46

Rubens: More than Heyman, then? Because Heyman's such a bon vivant.

26-00:15:49

King: He's a very outgoing person, but he did not go out there and just make one-to-one with all these students anywhere near as much as Tien did. So that, then of course, you must have recorded Chang-Lin and the football games at Memorial Stadium. There were, in those days, two press boxes up high on the stadium. One was used for the press, and the other was used for chancellors and presidents to entertain people. I hosted those boxes in both my campus and my system-wide positions a number of times. It was big fun. Of course, the chancellor is hosting a bunch of people in the chancellor's box, but where would Chang-Lin be? He would be down right next to the first down marker, or the line of scrimmage, right there on the sideline of the field with the Cal team, cheering them on and running up and down. That was a lasting image of Chang-Lin. He did a lot for school spirit. That sort of thing is not without purpose. It makes a lot of difference.

26-00:17:08

Rubens: How about the Lawrence Hall of Science? Do you want to talk a bit about that?

26-00:17:13

King:

The Lawrence Hall of Science, first of all, is, in many ways, Glenn Seaborg's baby, and was throughout his whole career. It had been built early while I was here. I think it must have opened in the late sixties. It was both a memorial to Lawrence, with lots of his things, and then got more and more developed as a science museum. Actually, science instructional methodology operation. Lawrence Hall of Science, over the years, has put out much that is used in schools as ways of teaching science. Glenn was very close to it. He was never actually director to it, but for many of his latter years, he was chairman of Lawrence Hall of Science, with an office right next to the director. The director in my time was Marjorie Gardner—another Gardner—succeeded by Marian Diamond. Those were my two directors, and yes, that's another search. I was the one that found Marian Diamond, who surely has an oral history of her own. A remarkable woman. I still recall her, at ages that seemed very advanced at the time—probably wouldn't seem advanced to me now—I would find her out there on the sidewalk, dribbling a basketball up and down or whatever. A very active individual and beloved as a teacher. Very, very well-known.

Glenn came to feel that the Hall was not treated well by the campus, first with regard to funding. [He believed] That much more in the way of funding should have been swung there, such as much more so-called nuclear science funds, which, in those days, were the monies given for the management of the National Labs, given to the university because we managed the National Labs. They were used as flex funds in those days. It's very different by the time I got into positions that dealt with them. Glenn felt that the university had not treated the Hall well. I think it had originally been under the vice chancellor for student services and undergraduate affairs. Probably was under Mac Laetsch when he held that position. However, the Lawrence Hall came up for reassignment to a new top administrator. With there being very little logic behind it, he asked that it be put with the professional schools and colleges. He knew me, I knew Glenn, from the longtime college of chemistry association. So I had the Lawrence Hall of Science and got involved with all of its issues of how it would raise funding and be funded, how it would manage itself. It had a building project. That was one of my building projects that we haven't written down on our list. As Marjorie Gardner phased out, it had the whole issue of hiring a director, and I described a little about, just now, the type of search that led to Marian Diamond.

26-00:20:56

Rubens:

Did you recruit her?

26-00:21:03

King:

I don't think she was an applicant. I think I did have a search committee. I think it was one of those situations where the search



committee hit upon her name, and so somebody, who may have been me, asked her would she be interested, and lo and behold, she was interested.

26-00:21:22

Rubens: So it wasn't a hard sell?

26-00:21:24

King: She was not a hard sell.

26-00:21:27

Rubens: What was the building? Will we come to that in time?

26-00:21:30

King: I'm not sure this has even been carried out, but it was to build an extension that would go to the south of the hall. It would hook on back close to where the real memorial to Lawrence has been in there, and lead on to additional rooms. That was the project. I am not at all sure it has been carried out.

26-00:21:58

Rubens: Is that adequately—

26-00:21:59

King: Yes. It was interesting. I enjoyed that one very much. It also was my one piece of background that equipped me for the day that would come when out of the clear blue sky came the need to have a tens of million dollars outreach project to schools and high school students on the part of UC. It arrived with the passage of regents motions SP1 and SP2. The hall did that. It gave me some practicing background.

26-00:22:37

Rubens: I think the Lawrence Hall of Science was one of the first programs to have a development person.

26-00:22:45

King: They had a development officer. That was another thing going on in my period as provost for professional schools and colleges. When I came in, engineering, business, and law had well-developed development offices. Chemistry had the started. I had started it in '83. It was '87 that I became provost for professional schools and colleges. The others all put it together during my time, so counseling units on how to do it and what they might think of was another part of what I was doing in talking with these deans. That was a period of some change.

26-00:23:36

Rubens: Are we at the point where we should go down the list of the building and projects committees you served on?

26-00:23:45

King:

Let's start off with some generalizations on that. First, why are there building steering committees, and why were they there in that time? Academic buildings represent a confluence of functions and interests. There is the academic unit it's being built for, who would like to design it totally themselves. There are campus architectural and design people who would like to coordinate the thinking on campus as to what buildings should be, and who might like to see some uniformity among them. There is the disruptive force of different architects for different projects, and that has to be because of the low bid practice of the university. That we're supposed to take the low bid among the architects, and we are supposed to move it around from one architectural firm to another. So we use many different architectural firms.

26-00:24:52

Rubens:

Where are those policies established?

26-00:24:54

King:

They're longstanding. They're state law, in effect, with regard to state-funded buildings. It's always been that the campus has used many different architectural firms. Another interesting part of that is that many of those firms have our own architectural faculty in them, which was another professional schools issue. The architect wants to make a statement. It's their one chance to build on the Berkeley campus. Oh, boy, I'm going to do something magnificent. Then there are the people who care about cost, both on the campus and at the system-wide level. There are state-wide people who care about costs, of course, in the department of finance and various other reviewers. There are a number of different interests that converge on a building project. The Berkeley campus had a name, and it was not alone in having the name, at the system level, of having a lot of change orders and cost overruns, and the original budget being this, but this and that change had been made, and now the cost was this, which was bigger, and there's no money, and what are you doing making these changes? The building committee was the thing established on the campus level to try to deal with that.

The building committees that I would chair, the idea was they should be chaired by a senior person from the chancellor's office. I ended up with so many, because so many were from the professional schools and colleges, and it's an engineering sort of thing maybe was another reason. The building committee is supposed to have the people from the unit. It's supposed to have the architect, the campus building engineering people, the campus architectural people, and any other entity that might be specific to the unique nature of that building. Put these interests together, and meet with regularity, which might be once a month. First of all, referee out places where there was conflict.

Secondly, make sure there was the utmost scrutiny given to anything that might raise the cost, and that we found early on that there was something at play that might raise the costs, rather than finding it later on, when there was no way of changing it, and to deal with the interface between the academic program and all these other parts of the building. It is the academic program that is probably most likely to lead to changes in change orders. Well, rightly so. If a building project is started at one point and then finished ten years later, there's been a lot of change in the academic program during those ten years. They might have hired somebody with very special needs, and they had no idea they were going to hire this person back when the project started. So things like that had to be dealt with. The function of the building committee was to put all of that together, test the various interests and desires against one another, and rationalize it out.

I had lots and lots of building committees. I had committees for new buildings. I had committees for building renovations. I had ones for planning of a college or of an entire precinct of the campus. I would really put the nuclear reactor decommissioning in the same category because it was the same kind of committee for a complex project. That's what they were about. There were different issues for the different committees. Maybe you want to ask—

26-00:28:48

Rubens:

We've talked, I think, about Haas and we talked about the chem e building. We talked a little bit about Soda.

26-00:28:56

King:

Soda was an interesting one because it was off the traditional boundary of the campus. It raised issues of what is the natural interface of the campus with the community. Particularly, there was an issue vis-à-vis Cloyne Court and people associated with it.

26-00:29:15

Rubens:

One of the co-ops.

26-00:29:16

King:

Yes. As to whether this huge thing was being put on top of it when it shouldn't be. Soda Hall had a lot of community interface issues. It of course started with the nuclear reactor decommissioning, and that had to all be carried out before the Soda project could even begin. I also remember a very interesting episode with regard to Soda Hall, where the question of what the exterior of the building would look like came up. There was both the question of what it is material-wise and what it is color-wise. My recollection is that, A, tile of about a foot by a foot of this green-colored—is it marble?—marble or relative of marble was put out in, of all places, the optometry parking lot, for people to come by and look at and decide if they wanted that color. I'm chairing the

building committee and the issue of the color comes up. We decide that the commentary has been sufficiently favorable to proceed with that color. Well, it looked rather different when an entire building, a big building, appeared in that green color, and was shocking to a number of people. That was a pretty good education in the fact that what looks just fine, one foot by one foot, may look very different when it's on a huge building. That was quite a radical color and exterior design at the time. I think it has grown on people rather well. I've grown accustomed to your face, that sort of thing. So it's okay, but it was a shocker when it started going up on the big building.

26-00:31:24

Rubens:

Has there been another one by Stanley Hall?

26-00:31:28

King:

I was not involved in Stanley Hall.

26-00:31:30

Rubens:

No, no, I'm just saying I can't think of another building where there's so much color.

26-00:31:34

King:

That's right. That was quite radical for the campus, and certainly radical for anything I've been involved in. There is color in business, but it's brown, muted colors. It's not something that comes out at you like that green does.

26-00:31:49

Rubens:

An early one you're involved with was the college of chemistry space study.

26-00:31:56

King:

Yes. Of course, I think I have described rather thoroughly how space is such a huge, huge issue for the college of chemistry. The dean had to reassign and assign every square inch of it. The college of chem space study was after Tan Hall was going to be, and the question is, what's the future beyond that? The questions raised were whether the college might get some space off that site. Another question has always been, what is the future of the roundhouse, the Melvin Calvin Lab of Chemical Biodynamics? Another was the future of Lewis Hall. Lewis Hall was built immediately postwar, post-World War II, 1946-48, and is not that well put together. There has been a pervasive question over the years as to whether Lewis should be fixed up, added onto, or torn down and rebuilt. That was a prime issue for the chem study project. I think there is a long-term plan pertaining to the college of chemistry that Lewis would be rebuilt, but we're nowhere close to it now, with the budget situation. That's the kind of thing we were doing on the chemistry study one.

26-00:33:25

Rubens:

I think we talked about Minor Hall.

26-00:33:27

King:

Yes, we've talked about Minor.

26-00:33:28

Rubens:

We did not talk about the Hearst Memorial Building.

26-00:33:31

King:

That's an interesting one. That one, I was in on just the first part of. That project was concluded while I was down in Oakland at the office of the president. The Hearst Memorial Mining Building was, seismically, very poor. Deficient. It had to be fixed up for that. To fix it up seismically turned out to be difficult. The interior of the building was odd in original construction. There had been some add-ons to that building over the years, too. The way the add-ons came in provided space that was less than fully useable. It was known going into that one that we were going to have to do a lot of reconfiguring of rooms and space within the building. There was a question of funding on that one. Private, public, where on the public list, would the Hearst Foundation come in big on it, et cetera. The seismic decision is the interesting one there, because that is the first building on this campus to be done by a technique known as base isolation. Base isolation means that, if you want to think about it conceptually, that the building will be implanted in a bed of silly putty or jell-o. When an earthquake occurs, that bed of goo will shake. That will then dampen greatly what shaking occurs on the building.

So base isolation was to be used, and therefore required an excavation all around the building. There was an enormous issue of historic preservation associated with that building, and the clash between historic preservation and cost. That building did get into a lot of trouble that way after I was down in Oakland, because what was done for historic preservation, and base isolation enabled that, did make the cost higher. I believe that is a split public/private project, ultimately, rather like Tan Hall. It also got into the same problem that Tan Hall got into as it went along, and that is, would the public and the private money appear on the same timetables? Both have herky-jerkiness attached to them for different reasons. I'm very pleased with that Hearst Mining project and glad to have been a part of it. Of course, I get back into that family later on in another one of these sessions. It's George Hearst that the building is named for, the miner and the father of the publisher. It's Phoebe Hearst who gave the money. I will meet Phoebe Hearst again later.

26-00:36:54

Rubens:

Now, you're chair of that committee because it falls under the domain of the—

26-00:36:59

King:

It's within the professional schools and colleges.

26-00:37:03

Rubens:

We did not talk about the Projects Coordinating Committee. You mentioned it.

26-00:37:07

King:

That was where there needed to be coordination among projects, and that we needed to have something that looked at the projects all together, since they would impose in different ways on the campus and on one another. I do want to mention another one which I was involved with, which was the northwest precinct project. That one was to look at a big chunk of the campus, the entire northwest portion, including Warren, the biochemistry building (Barker, it now is), plant genetics, the whole college of natural resources, Giannini Hall, Hilgard Hall, et cetera. Tolman is part of that.

26-00:38:00

Rubens:

Is Morgan part of that?

26-00:38:01

King:

Morgan, thank you, and the forestry building. Mulford. That was it. The question was, what rearrangements of assignments, what replacements of buildings, what modifications of buildings, might be made in the entire precinct to serve all those programs.

26-00:38:24

Rubens:

Who identifies this as a problem and says we need to do this study?

26-00:38:31

King:

I'd like to say I did, but I don't think I did. I think it was whoever had charge of campus planning at the time. For part of my term as provost, that was Bill Liskamm, but I think it may have been Leroy Bean that had gotten to—

26-00:38:49

Rubens:

But it's campus planning?

26-00:38:50

King:

Yes. Or Rob Gayle.

26-00:38:53

Rubens:

Steve Finacon, who's at the Capital Projects office here at Cal, will know that. He knows so much about the campus. Because of your position you're naturally asked to—

26-00:39:03

King: So many of those were my units. I guess they all were, including plant genetics. It was all my units.

26-00:39:14

Rubens: How long does that go on?

26-00:39:17

King: That went on for about a year and a half before I went down to Oakland. I'm not sure how much longer it went on after that.

26-00:39:25

Rubens: Did you have a strong feeling about—

26-00:39:28

King: I enjoyed the building projects very much. They were specific things. Again, they fit into this realm of very complicated situations with lots of interests at play. The solutions have to be figured out rather than jumping out at you. The results are certainly very tangible.

26-00:39:51

Rubens: Did you have a strong feeling particularly about the northwest?

26-00:39:54

King: No. Actually, I think it was not on our list of things to be done, but the campus has come up with two quite different things with regard to that northwest precinct since the time of what we did. I think there are renovations of Hilgard Hall that resulted from our study, and Barker. It's Warren that came out differently, in two ways. One is that the campus, again, while I was down at the office of the president, came up with the idea of—I'm not sure I'm going to get the word right—decantation buildings. Buildings that would be simply for the purpose of moving people while other projects were done. The replacement to Warren was originally going to be one of those. The other one was going to be the building on the far side of the corner of Hearst and Oxford that is now occupied by information services and technology.

The other thing is they then did ultimately was to decide simply to rebuild Warren Hall totally, of a size that was suitable for all of public health. That is what is now being done.

26-00:41:25

Rubens: I have on the list also Boalt Hall expansion.

26-00:41:29

King: This was the law school needing some more space and wanting to do so by creating a new library. It was the idea at the time. There's been another expansion since this one. This was the first one [in Law] that was going to be privately funded, so there were issues of could the law school raise the money, and how much money do you indeed have the

capability of raising from law firms. Boalt is interesting in many ways. I've been told, and I believe I've actually seen things in writing, that say that it was turned on its axis ninety degrees after its design and before it was constructed. What faced, in my time, out to Bancroft Way, was the front. That was supposed to face west in the original design. That's why you're left with nothing very evident when you try to enter Boalt Hall coming from inside the campus itself. That is now being worked on. Indeed, there's a project that obliterates the old front that is now a current project. Boalt was a very interesting building to work with. On that one, the architectural issue of how to create the addition, of what to do with regard to the parking, and how to make the scope and size of the project commensurate with the fundraising abilities of the school. Those were the interesting ones. The law community, for all one may think about it, is not historically very attuned to giving. Big national law firms are not historically attuned to giving. Lawyers who make a lot of money, some of them give, but again, it's not endemic within the profession. That was an example of a project where, as we defined the project, the central development office of the campus had to assess the ability of the law development operation to raise the money. Another factor coming together.

26-00:43:55

Rubens:

Boalt has been pretty successful raising money for capital construction.

26-00:44:25

King:

That's a change from my day. That shows the maturation of development within the law field.

26-00:44:33

Rubens:

Do you think we adequately covered these committees?

26-00:44:40

King:

I think we probably have. Good place to let it rest for a month and a half.

26-00:44:45

Rubens:

Shall we do that? Why don't we stop.



Interview 12: September 6, 2011

Audio File 27

27-00:00:01

Rubens:

Good afternoon, Jud. It's our twelfth interview. We've had a month hiatus basically. Today we're going to take up your move to the office of the president and we were chatting prior to our going on tape that there are several topics to be taken up. Let's first start with, though, how did it come about that you moved from being provost for research to provost for professional schools and colleges?

27-00:00:38

King:

Well, okay. A little bit of philosophy to precede that. I'd come to the conclusion over the years that about the right length of time for holding a job is six or seven years. And the reasons are this. That you have your new ideas and your new ways of doing things during the first several years of doing that job. Then you're practiced at it. As you pass, say, the five years point, the number of new ideas start going down. You've had your new ideas. At that point, it is probably best for you—and probably also for the job—that you move on to something else. So there's always been a certain degree of stimulation associated with a new job and I always thought that should come after six or seven years. So I was in the provost position at Berkeley for seven years and as we reached the end of that I had really made a decision of my own that I would point myself toward doing university administrative things for the remainder of my career. And that was an interesting decision, too, because you start into administration there's always the feeling you can come back, this will end. And in my case I had kept the professorial work and particularly the research going during practically the whole time I was an administrator. So I could come back and do that. As I went through these administrative jobs I came to the conclusion that I enjoyed doing them and that I was well suited for them and that is probably what I should be emphasizing for the rest of my career. I've always liked change, too, and to keep doing just the same chemical engineering year in, year out would not have had that aspect of change.

So with it being seven years in the provost position I had in my mind the question of what I might move to. And there are not all that many possibilities if one is stay within UC. I had occasionally looked at things outside of UC. However, you do build up a certain investment in the retirement system and in the institution, the love of the institution, and those factors certainly became important as the years went on. And secondly, Jeanne—and I, but mostly Jeanne—had invested considerable time in coming up with the right arrangements for our handicapped daughter Catherine, and California does very well

by such people. I hope it still does after the budget problems we have. But certainly at that point in time it was doing very well by such people and Jeanne had identified a very good setup for Catherine to move away from all of that into some other state that didn't have what California had would have been problematic. And furthermore, we liked California for the outdoor activities and everything about it.

So it became a matter of a career that would probably be totally within the University of California—that would make sense—and so the question was what are the options? Well, I could have done something different or higher on the Berkeley campus and the office of the president is the other logical option if one is not going to leave Berkeley. So I was thinking about the office of the president. I was thinking about things on the campus. And at the office of the president, Walter Massey had come from the National Science Foundation to become provost for the system. And at the same time, this was the break between the presidency of Gardner and the presidency of Peltason.

At that point in time there had been taskforces at a high level on restructuring the university and its governance, chaired by Chuck Young, in fact. Transition Taskforce I think was the name of the principal body. And one of the things they had defined a need for was attention to research at the level of the system. And it was at that point in time that the position vice provost for research down there was created. I became aware of that and in thinking about it, although my administrative background was not in administration of research—it was a brand new position. It would enable the opportunity of defining and building this brand new position.

The other thing is that—and here I may be a different or peculiar sort of person—the office of the president you know was always Peck's bad boy. It was held in a bad light on campuses, as if it was problematic in some way. I look back on all of this and I think it's inherent in the structure that the office of the president would be regarded in that way by campuses. But nonetheless, it was thought that the office of the president was a problematic place. Well, here I am, the engineer who likes problems and creating good solutions to problems. So the challenge that that posed was also something that made things interesting for me.

At the particular point in time, it was not apparent where I would be going next at the Berkeley campus. John Heilbron was in office, gave no sign of leaving. (He did leave shortly thereafter.) But at the time that the vice provost for research position was on the table for me, he was well ensconced with no prospect of leaving and Chang-Lin was midway through a very successful chancellorship. So although the

position of vice chancellor, which subsequently became provost of the Berkeley campus, would probably have been a good one for me and certainly would have been attractive to me, it did not seem to be a possibility at the time. And the different aspect and the fact that it was still on target for a career plan, this vice provost for research position, that became what won me over. So I interviewed a few times with Walter Massey.

27-00:07:48

Rubens:

Basically you contacted them or did they contact you about it?

27-00:07:51

King:

No, they contacted me. Actually, what happened is that John Heilbron had a COVC, council of vice chancellors, meeting for the system. He had talked with Walter about me and Walter had expressed interest. And so with that, the search came to me and asked me if I wanted to be considered for it and I thought about it and said sure and was considered and was selected for it. So that was all in 1994, which was the last of the VERIP [Voluntary Early Retirement Incentive Program] years on the Berkeley campus, as well. That got into some things that accompanied my move because after I decided to move to the office of the president, Heilbron then decided that he would retire and Chang-Lin made the decision he would then consolidate the administration. So it was also at that point in time that we went from the two provost system to the one provost system. And with that, Carol Christ, who had been the other provost, was appointed by Tien as—what was the title? EVC/provost I think is the title. Executive vice chancellor/provost. So that all happened during the spring of 1994 and as of July 1, 1994 I found myself walking into the Kaiser building, with a brand new position that had been just simply identified as a need. And as I got into my conversations with Massey, and as I got there, I discovered that not much definition of what the position should and would be had been done at the point.

27-00:09:46

Rubens:

Had you had much contact with the office of the president prior to this appointment?

27-00:09:59

King:

Not a lot. I had had some with Cal Moore and with Ellen Switkes down there on explicit personnel cases and how to handle them, where there were issues of policy involved. And then the other thing is that whenever you get into a legal situation, the university is structured so that there's office of regent's general counsel, which is many lawyers down at OP and just one lawyer on the campus who does the odd jobs and serves as liaisons to them. So on legal issues I had often been in touch with somebody within regent's general counsel. But I would say

not a lot of contact with the office of the president except on very specific issues.

27-00:10:49

Rubens:

Now, you had mentioned there were at times on campus a historic kind of contest with, or if not contest then sort of darkened view of the office of the president on the part of faculty or the independent individual campuses. Did anyone say to you, “You’ve now gone to the dark side.”

27-00:11:09

King:

Oh, I’m sure, yes. I’m sure that happened in many ways, although I don’t remember specific instances.

27-00:11:14

Rubens:

Okay. It wasn’t an impediment.

27-00:11:19

King:

That, in an odd way, was an attraction to try to deal with something that was a difficult situation and I felt I was good at making things work well for people and for faculty and so I would certainly have an opportunity to do that. There was no place to go but up.

27-00:11:36

Rubens:

Sure. And change that view.

27-00:11:39

King:

In the office of the president. And changing the view was one of my goals in taking all of that on. That’s one of the things that I had in mind that I would try to do. I look at all of that in hindsight. As I say, I think it’s inherent in the structure. And my reason for saying that—it’s not just the faculty on the campuses who think the office of the president is the dark side. It’s the administration of the campuses who think that, too, often. And the reason is that the office of the president is placed as the body that deals with the regents and that deals with the state legislature and that deals with the governor, and therefore, when the politics of it all come bearing on the university, the place they bear is the office of the president. So to a person on campus it looks like the results of all the political machinations are a product of the office of the president. I think in many ways, in most ways, they are not. They are instead the political things that came to the university from the legislature, the regents, et cetera, and it has been tempered by the office of the president before it comes through to the campuses and therefore that’s an interesting role and an important role. And I think in line with that, one of the most important roles of the office of the president is to keep the direct political pressures off the campuses to try to temper them before they come down.

27-00:13:12

Rubens: Sure. And we'll have a case study of that when we move to SP1 and SP2 and all that.

27-00:13:17

King: We certainly will.

27-00:13:19

Rubens: Okay. So you had in mind, of course, improving relations between campuses and UCOP but how else did—you were saying, and I interrupted you—

27-00:13:26

King: Well, I had the opportunity to define a position. What was the appropriate system-wide role with regard to all the things pertaining to research? Now, that's issues of research policy, having policy exist and be uniform across the system. It is issues of making sure that the university is in compliance with various federal regulations where the threat, if you aren't in compliance, is that you'll have all research grants removed from the university. So that's a pretty big threat. So how to have that happen. How to do things that would enable research to work well and better for the faculty, so enabling aspects of it. And then, finally, the university has its long history of the management of the national laboratories and that has an interesting recent history, leading up to my time of arrival there, because historically the oversight of the labs had been the role of the provost and senior vice president for academic affairs. For example, Bill Fraser in the time of David Gardner, and a staff of perhaps two or three people.

Well, with contract renewals and the agreements that went into them and with the interest of the legislature, particularly people like Tom Hayden, the university had just, within the year before I went down there, taken the step of greatly increasing its office and its functions for the management of the labs and it had done so by changing this three or four person operation, which had been in academic affairs under the provost, to an office of laboratory affairs which was under the senior vice president for business and finance and which had far more people than were in academic affairs. Nonetheless, there remained four people in academic affairs, three of them professionals, one of whom had been the position of working from the office of the provost, overseeing the labs. That had for years been Jim Kane, a graduate of the College of Chemistry Berkeley. That position had been vacated and it was filled temporarily as I arrived by Tommy Ambrose, whose real position had been as the onsite UC liaison to the Lawrence Livermore Lab. So Ambrose in two jobs was two of those four people. And then the other one was Dick Kropschot who was the resident person at Los Alamos. Then there was one staff person supporting all of this who was Elaine Stamman. That was the office I inherited and

there was a bit of redefinition to be done there, too, because it had previously existed and functioned without all of this over on the other side of the house at the office of the president. All of that was now under the business and finance vice president.

Along with what were in fact the academic roles with regard to the management of the national laboratories—another thing I picked up with that was the president’s council on the national labs, which was also relatively new at that point. There had always been advisory committees for the labs, at least there had been for ten or twenty years before. But we now had a president’s council that was a higher-level body that was going to judge the program content and the contract we had taken on with the Department of Energy; they would rate and judge and give numerical evaluations of the program content of the lab. So we had to define that, too. So that’s a long way of saying that there were research roles with regard to the management of the national labs that I found myself immediately into as I got down there, too, in addition to everything that had to do with research within the university itself.

27-00:18:21

Rubens:

Had there been some sketch of what the job would entail? Or was it your task to just spell it out?

27-00:18:28

King:

It was really my task. I would say there was a loose sketch, but very loose. Filling it out to what would actually be done and how to do it was my role.

27-00:18:41

Rubens:

So you’re under, is this right, the provost of academic affairs.

27-00:18:45

King:

Yes. I was under Walter Massey. I was the one academic reporting to him. And that’s another reason the position had been created, was to—and this goes back and forth over the years. But the feeling was that there should be another seasoned faculty-type academic within academic affairs at OP. We can talk about how that’s ebbed and flowed over the years. It actually grew more while Dick Atkinson and I were there when I was provost and now recently has become far less. So it’s something that doesn’t stay constant.

27-00:19:31

Rubens:

So before we unpack then some of your specific tasks that you took up, goals that you had, is it worth saying right here how you assessed the health of the office of the president and the whole nine campuses at the time?

27-00:19:54

King: Well, I would say that—

27-00:19:56

Rubens: Peltason was in his second year of president. He'd leave in '95. He came in '92.

27-00:20:06

King: Yes. Yes. Peltason was in his second year, that's right. And we had therefore very recently had the ten, almost ten years of David Gardner as president. David had done a lot of building of the office of the president, some would say too much, but nonetheless it was a solid structure and organization and it was continuing without any great change.

27-00:20:36

Rubens: Despite this task force regarding re-organization—

27-00:20:37

King: Well, despite the transition taskforce which actually built it a couple of ways, vice provost for research being one of them, and despite the transition to Jack Peltason as president. It really hadn't changed all that much. The thing that was probably most different, which also put upon me an interesting role, was Walter Massey. And the thing that was different there is that previous senior vice presidents for academic affairs had come from within the UC system and knew the UC system. Walter did not come from within the UC system. He had been at the University of Chicago and then had been director of the National Science Foundation before coming to UC as provost. So, as for anybody finding themselves suddenly thrust into the middle of UC and how things are at UC, Walter had a lot of learning about UC to do to know what were effective ways of working with the Senate, what would not work well, what might be a creative approach to getting Senate support for whatever he wanted to do, that kind of thing. And that became my role, was as counselor to Walter on what UC is and how it works and what will work, what won't work.

27-00:22:10

Rubens: And then financially? Affirmative action was going to be the big political—

27-00:22:14

King: Affirmative action has not arrived. It's arriving during that year I'm here.

27-00:22:18

Rubens: It's arriving, certainly initially, because of the Cooks. So financially the university was in pretty good—

27-00:22:25

King:

Yes, we were in financially quite reasonable times at that point. Not wonderful but not really threatened in some way and no drastic lowering of budgets. So financially it was okay. So that was more or less the situation. Of course, we were at that point about—maybe a little over halfway through what was a ten year leased term at the Kaiser Center, which was rented space.

27-00:22:56

Rubens:

A beautiful, dramatic space. Where were you in the Kaiser?

27-00:23:02

King:

I was on the eighteenth floor and that was the research function and other support functions to the senior vice president for academic affairs. The senior vice president was on the 21st floor. So I had a very nice office in the center of the eighteenth floor. I got back to campus from time to time and one of the things I would come back for were meetings of the College of Engineering external advisory board, where I got to meet Lou Oppenheim. I knew him well before going to the office of the president. Lou Oppenheim had been a senior official of the Kaiser Corporation. I discovered in talking to Lou that I had his office on the eighteenth floor, his old office.

27-00:23:58

Rubens:

And did you have a support staff? How many people under you?

27-00:23:59

King:

Oh, yes, I had a support staff. The OP had been rearranged and I had people who had come from various parts of OP and had been put together into this [office] and had not worked together before. That was another challenge, was to try to get this functioning as a good team. But the people I had working with me, one was Eleanor Lee who was all research policy matters for the university. That was her expertise and her job. I had Carol McClain and Niall Mateer, who between them were staff on the multi-campus research units, of which there were about thirty-three.

These are organized research units that are not just for a single campus. They are for the whole system, typically with a prime principal location on one of the campuses but serving the entire system. So I had those. I had the lab people. I had a person [Marc Aarens] who was charged with analyzing legislation, which is a very principal role for the office of the president. So anything that's in state legislation [concerning the university's interests] that's been proposed by somebody gets analyzed within the university and for anything that was in the research area or really for the wider academic area, that position handled that. I finally had Todd Greenspan, who had been in Joyce Justus's office while she was there. And Todd also was sort of



generally knowledgeable on the master plan and on a wealth of UC issues—in a sense, an institutional memory of UC. So that was the kind of staff I had, around ten or twelve people.

27-00:26:07

Rubens:

So you had a fairly large portfolio and I would imagine a lot of studying to do yourself. You understood the politics of the system but—

27-00:26:19

King:

Yes.

27-00:26:20

Rubens:

Administrative politics but—

27-00:26:22

King:

The administrative politics, of course, and then various issues. I had never had a post that was research administration per se, so there were aspects of research policy. I fortunately had been on one of the preexisting advisory committees to the national labs. But it was not the right national lab. It was the Lawrence Berkeley National Lab. So I had been on the SEAC—Science and Educational Advisory Committee. The one that oversaw Livermore and Los Alamos in the old days was SAAC and I don't remember what the two As stand for there. But I had some eye to the administrative issues surrounding the Lawrence Berkeley Lab. What surrounded the weapons labs was learning for me.

27-00:27:26

Rubens:

So is it appropriate to talk first more about your science background, how that really served you?

27-00:27:35

King:

Yes. That's fine. Then we'll also want to get into the California Council on Science and Technology, which is part of this, too. Since so much of the research policy issues and the government oversight and compliance issues, since so many of them deal with science and technology research, I think it was a good—my background was a good match to that because I had done science policy things and it wasn't that new a world to me. In fact, I'd been involved subsequently in some searches that lead people to fill research positions and the question becomes could a non-scientist do it at all. That's sort of the world we're in nowadays.

27-00:28:34

Rubens:

Do you know if there were serious contenders for the position or was it kind of a slam-dunk, no brainer when you were willing?

27-00:28:43

King:

I think what was done was the standard UC procedure of narrowing it to three finalists, having a day in which the three finalists were interviewed and then Walter made his decision. So who the other contenders were and how serious they were I don't know.

27-00:29:00

Redman:

Were there examples of administrators in that position that did not have a science background?

27-00:29:07

King:

In that type of position, yes. And by that type of position I'm going to include all of the campus of vice chancellor for research positions. Oh, there's been a very successful one who held office for years and years at San Diego, Dick Attiyeh, who was a political scientist. He did very, very well. A good person can understand what's needed and do it. I don't think there's an absolute there that this person must be a scientist. However, if they're not then they've got a steep learning curve on some things. They can do it.

27-00:29:46

Redman:

Was there any sort of campus reaction with this appointment of Dick Attiyeh?

27-00:29:58

King:

I don't know the answer to that because Dick Attiyeh had been in office for years when I started dealing with him from the office of the president. He certainly was well regarded during the years when I was there and he was at San Diego in office.

27-00:30:14

Redman:

And do you think that your particular experience with a science background played a role in your initial winning of the position?

27-00:30:27

King:

I'm sure it was a useful aspect to have that kind of understanding.

27-00:30:31

Rubens:

Just parenthetically. Is there not an office of compliance on each campus that deals with the federal contracts for the campus?

27-00:30:43

King:

Well, the answer to that is there's not one of those on each campus because each campus is organized differently and there are on some and there aren't on others. But nonetheless, I think there's still a need for system-wide serious attention to this because even if there were ten offices on the ten different campuses, they're going to be different qualities of their doing the job. And you don't want your weak link to get the whole system in trouble. So you have to pay attention to it from a single institution viewpoint.

27-00:31:28

Rubens:

So how did the relationship to CCST then come about? We talked about this in an earlier interview, but it might be useful to discuss it in context here.

27-00:31:36

King:

Well, so Walter Massey was the chair of the California Council on Science and Technology, which at that point had been in existence I'll guess something like four or five years. And let's back up to why CCST was formed. It's unusual and it is important to California. There had been interest on the part of the private universities in California in having some access to the research functions of the State of California, i.e., being able to compete for research support. That's an issue because the University of California is designated in statute as being the research arm of the state of California. So some of the privates felt they were not being served well there. So there was an effort originally to form something like the National Science Foundation for California, which would be a research supporting agency at the state government level to which people from any and all universities could write proposals and get funds. As that issue was considered, it was also recognized that there is a science advisory function similar, if you will, to the Presidential Science Advisor needed in California or similar to the National Research Council, which is what eventually came to pass. So the result of all of that deliberation was that Sam Farr and I think it was John Vasconcellos were the two sponsors of a bill that went through the legislature formally establishing the California Council on Science and Technology but not budgeting it and it wasn't part of the state government. It's a recognized external body with which the state government would deal, in that sense, very similar to the national academies and the National Research Council on the federal level.

So CCST was formed. It had been through some throes of what it should do. And one of the possibilities for what it should do is be like the National Research Council and provide advisory studies. That's what eventually became the mission. But en route to that the council had actually decided to start an independent operation directed towards clean cars. And so it got itself into a situation where that project was the big thing. That was the interest of the initial executive director. So there are these issues as to what it should be and what happened with regard to me is very simple. Walter, who was the chair of CCST, asked me to come along to every meeting and simply told them he was going to bring me along. I had no status. I was sitting there on the side of the room and would listen and hear everything and watch everything that went on and then deliberate with Walter after we got back as to what might be done.

27-00:35:21

Rubens:

You had no status with the council?

27-00:35:23

King: That's right.

27-00:35:24

Rubens: Because Massey was the one who was—

27-00:35:25

King: Yes, yes. And I would—

27-00:35:26

Rubens: How many people were on the council?

27-00:35:28

King: Well, the council has a board of about ten people which serves as a board of directors and then has the council itself, which is as many as twenty-five people and then there's a chair of the council itself. That's what Walter was, was the chair of the council himself. Karl Pister has been the chair of the board forever and ever and still is. So Walter was the chair of the council and, in effect, he saw this as a very integral part of his UC job and wanted to use me to get a second head thinking with him with regard to the rather substantial issues that were going on there. So that was my start with it.

And then jumping ahead, but I'm not jumping ahead for good. After a year of vice provost for research for me, Walter leaves and at that point I got asked to be a member of the council and eventually became chair of it in later years. So I had a lot of experience with it. But during that period when Walter and I were working together and in the one or two years after that when Susan Hackwood was hired to be the executive director following the original executive director, it was at that point that the mission of being very like unto the National Research Council and serving as an advisor to the state when wanted got hatched and that has been the mission of the—

27-00:37:11

Rubens: And were you pushing that? Was that something that you advocated ?

27-00:37:12

King: I was very much part of that. Yes. But not just me. There are lots of people.

27-00:37:19

Rubens: How do you talk about division of time in terms of these various oversights that you had?

27-00:37:30

King: That is something I noticed upon going to the office of the president, is that there were a lot of different things that had to be done. It's not just the division of time, it's also prioritization because the other distinguishing feature of the office of the president vis-à-vis the

campus is that things move much faster. So if I had some big thing I had to think out and deal with on campus, I would surely have a week and perhaps a month to deal with it and go through the necessary consultations and back and forth and what have you. Down there, if this had come from a legislator or from a regent or was building up to a regent's meeting, you could very often be on a much faster timetable than that, when the issue might arrive one day and either the next day or the third day you've got to have done whatever is going to be done. So there are two issues there. One is you have a lot of things you're doing and overseeing, which is sort of inherent to the system level position and therefore you've got to apportion your time among them. But the other is that you've got to make sure that what you're doing next is the thing that really needs to be done next because of this fast moving issue thing.

So what's the answer to that? I have always worked by having a lot of things going at once and multitasking, if you will. There was nothing new or different about that except it was the most intense it's ever been. I think what you have to do is continually reassess what it is that needs to be done. What are your longer-term needs that you have to be dealing with? What are your shorter term immediate needs and in that sense what is the best use of your time? There's another thing you have to be careful about and that is not to give your calendar away completely because it will fill with the wrong things if you do that. So you've got to make sure that the right things are getting onto your calendar with the right immediacy. That's another thing to be worried about.

27-00:39:51

Rubens:

So what were your priorities then that first year?

27-00:39:56

King:

Defining the office. Getting it to work well. Defining this new role with regard to the national laboratory management, where we have just whatever is the academic component within that office. Learning the weapons laboratories and what that was about. There were some immediate research policy issues. One result of not having had such an office is that the university as a system had not prioritized out what are the policy issues it must most immediately deal with. So there was sorting of that out and getting things going on.

And then there were some routine things, routine but interesting, like continually appointment of new directors for the multi-campus research units, reviews of the multi-campus research units. That was sort of ongoing.

27-00:41:06

Rubens:

And that was under your portfolio.

27-00:41:08

King: Yes.

27-00:41:09

Rubens: What would be an example of policy research that had to be prioritized?

27-00:41:20

King: I want to think of one from that year. I can pull ones out from other points in my career but—

27-00:41:26

Rubens: I was going to ask you if there were things you really faced.

27-00:41:33

King: Human subjects policy was in a state of flux at that point so that was one we had to pay a good bit of attention to. Others that were quite active and fluid at that time had to do with technology transfer, because this was also a particular point in time with regard to the university's tech transfer efforts. A short history is that system-wide handling of patenting and relations with industry began back in the 70s with a very small office that tried to serve the entire University of California system. In the years just before I got down there, there had been a very large system-wide tech transfer effort built that was headquartered on Harbor Bay Island in the area of Ron Cowan, a famous name, who was a developer who oversaw Harbor Bay Island. That's the northern part of the island that the Oakland Airport's on. Just across from Alameda to the south.

And so there had been this Harbor Bay Island development. And our tech transfer had been put out there. Now, it had been through some flaps that had to do with Cowan's activities and with the possible involvement of our head of tech transfer with Cowan in these things. That was all water over the dam. But there was an issue of what the office of technology transfer is trying to do and, as a corollary to that, is it right to have it out there rather than in here where the rest of the office of the president was. So there had developed a feeling within many parts of the university that that office was strictly in the business of making money and that it should put some other things on at least as high a priority level. One of them is getting the inventions of the university out there and actually used, because that's a good thing and because it's useful to the university to be able to say that to legislators with specific examples. So to get things out there and actually used, and secondly, to try to help the faculty in their relations with industry rather than being a separate standoffish office over there that got in the way of the faculty's relations with industry. So those were issues on the table.

We had to try to deal with some issues of what was that office in stating the right policies. That was the main thing in my time. Over a much longer period of time, we have actually gone to where that office of technology transfer has done two things; one is devolve its operational functions almost totally to the campuses so that it's now more of a policy office. And secondly, that remaining office no longer reports to the senior vice president for business and finance, it reports to the vice president for research, which is what the vice provost for research has now become and who reports to the provost. So the office of tech transfer has switched from the business side of the house to the academic side of the house over the years and that's a statement in itself as to what the priorities are.

27-00:45:49

Rubens:

So people would have to prepare memos for you and do research and then you'd have to review them?

27-00:45:56

King:

Yes. That year that I was vice provost for research, the staff were very capable staff and it would work very well by them analyzing something and working out a draft of something and then all I had to do was deal with the draft, which is very helpful.

27-00:46:17

Rubens:

Yes. It's still time consuming?

27-00:46:19

King:

I have to say that was uniformly true throughout my time at the office of the president. There was a very competent staff that could work in that mode. So a little conversation with you, go research it, analyze it, draft the product and the product comes to you in pretty good shape.

27-00:46:37

Rubens:

Was the whole salary schedule higher? What is it that drew people that were competent and hard working?

27-00:46:44

King:

The salary scale is a bit higher, yes. And there were a number of people there who had been on a campus, typically Berkeley or San Francisco, and then had migrated into the office of the president as their career went on. So it tended to be very experienced people and very sharp people.

27-00:47:02

Rubens:

Kind of weeded out the people who were not competent.

27-00:47:04

King:

Yes.

27-00:47:09

Rubens: Did you meet with the president?

27-00:47:21

King: During that year, there was no president's cabinet, or if there was I wasn't part of it. I would certainly meet with the provost with enormous frequency, but very rarely with the president. And I would go to regents meetings. I probably had a time or two when I made a presentation to the regents but I don't remember what it was off-hand. But Walter wanted me at the regents meetings for the same reason he wanted me at CCST. I was to listen, analyze and think. And then there was another thing happening during that year, which was the buildup to SP1 and SP2. Walter made three or four quite substantial presentations to the regents on admissions policy. This would have been during the period of November of '94 through—well, leading up to July 20, 1995.

27-00:48:39

Rubens: This has to do with the beginning of the Cooks letter to the—

27-00:48:43

King: The Cooks, yes.

27-00:48:44

Rubens: So we'll pick up that whole I think in one piece.

27-00:48:47

King: All right. But the buildup to it was during Walter's time as provost and my role was to be one of several people to whom Walter would rehearse before making a presentation.

27-00:49:09

Rubens: You must have learned some pretty interesting things about kinds of research that were going on throughout the system.

27-00:49:14

King: That's one of the most wonderful parts of the whole thing. I think I've said that with regard to my whole career. That going from the College of Chemistry and suddenly seeing thirteen professional schools and colleges and what makes them tick was wonderful. Well, by going to the system level, two things happened. One is I saw nine—well, let's be careful on our number—eight other campuses—

27-00:49:38

Rubens: I was going to say did you literally visit them?

27-00:49:40

King: Oh, yes. Sure. And I did research visits to all campuses. This is very similar to what I did when I became provost for professional schools here, went to all the schools. But I went to the campuses, to the



research person on the campus. So Dick Attiyeh at San Diego and so forth. I did that and discovered that the campuses are quite different from one another. And then the other thing is there's a whole rest of the world with regard to research and research topics that I suddenly came to and found myself having to make decisions about, like the Dickens program and the Shakespeare program.

27-00:50:22

Rubens:

I was going to say humanities and social sciences.

27-00:50:23

King:

Yes. I liked that, I enjoyed that. It's mind opening, mind expanding, if you will. New things.

27-00:50:58

Rubens:

All right. So then you become interim provost and senior vice—

27-00:51:03

King:

Yes. So what happens is while what led up to SP1 and SP2 happened, there was also a presidential search going on.

27-00:51:21

Rubens:

Why did Peltason leave? Was there a story though? He was only there for three years so had he just decided not to be it or was he being targeted or—.

27-00:51:50

King:

I don't know from conversations with Jack directly but my strong impression is that when Jack was selected and when Jack took the job it was with at least the tacit understanding that it would be a relatively short presidency. And that's often been said and I think it's true and I think Jack went at it that way. And Jack, of course, had some horrible years to deal with. Actually, I said the budget was okay. I should not have said the budget was okay, because that was not good time. So scratch the previous statement. Jack actually had very difficult budget situations to work with. And then, of course, everything that led up to SP1 and SP2 worked in with that.

27-00:52:48

Rubens:

So they knew he was leaving.

27-00:52:51

King:

I think he had announced a resignation maybe fall of '94 and a search had been ongoing. This is the search that led originally to Gordon Gee, if you remember that one.

27-00:53:10

Rubens:

I do not.

27-00:53:12

King: That got leaked by the press or to the press from the search committee that Gordon Gee had been offered the presidency of UC.

27-00:53:23

Rubens: Who was he?

27-00:53:25

King: Oh, he's been president of five institutions now. He was the president of Ohio State at the time. I'm going to miss some in counting here. But he's subsequently been president of Vanderbilt. Anyhow, he's back at Ohio State now. So this would have been a president from outside of UC and given that Gee was at the time over in Asia and two days after this broke he withdrew his name from the presidential consideration. So that had been a rather messy part of a presidential search.

27-00:54:09

Rubens: Was he a scientist?

27-00:54:09

King: No, he's not a scientist. He is just somebody with a reputation of being a very solid university administrator. So I think with the withdrawal of Gee—and mind you, I don't know that he was offered this. I'm just telling you what was in the San Francisco Chronicle. But with the apparent withdrawal of Gee, then I believe the search went back looking at internal people and of course eventually Dick Atkinson being selected.

27-00:54:42

Rubens: There must have been plenty of scuttlebutt at the office of the president about that.

27-00:54:49

King: I'm sure there was, yes.

27-00:54:51

Rubens: Who's on the search committee for the president?

27-00:54:54

King: I don't know who was on that search committee, but it's all regents for a president. For chancellor it's half regents. The search committee for president is all regents and then there is an Academic Council advisory committee to it and there are two faculty who are members but not members. They're not members of the committee but they are the liaisons from the faculty committee to the committee. So it's very much regents.

27-00:55:25

Rubens: All right. So Atkinson is coming in, in October.

27-00:55:28

King:

Well, let's back up a little. Atkinson was not coming in at the point where—let me go back to the buildup to SP1 and SP2 and the fact that there was a presidential search. There was much scuttlebutt about where Walter Massey would stand in that presidential search. I don't know what was in fact the case but I certainly know that there was a lot talked about, including in the newspapers on that. And Walter, at a point in time which was probably mid-June, came to us and told us that he had decided simply to take another position and the other position he took was presidency of Morehouse College, which he [then] did for ten years or more. And did so very successfully. I frankly think that was a very logical thing for Walter to do. He, first of all, is a Morehouse graduate and it was very important to Morehouse to have somebody like him. So I think that made it attractive to him. Also, Walter is a creature of Washington and of higher up things that are outside of institutions. He was, for example, the chairman of the board of the Bank of America at the time when it had the issue with its CEO just a year ago. And so Walter was the one dealing with that. But I think Walter felt that the smaller institution, the greater availability of time for moving on the national circuit and the fact that Atlanta is a lot closer to Washington than San Francisco is, that those were attractive things. So at that point in time Walter announced he was leaving and then here came SP1 and SP2 heavy on the heels of that. There was a question of what to do with the provost position because Walter was leaving August 14th of that year to go to Morehouse. He took this position about one month before he started it.

27-00:57:47

Rubens:

We're talking about '95?

27-00:57:49

King:

'95. And I don't know what went on at the higher levels of the university but I do know that Jack Peltason came to me and said, "Would you be an interim provost? We're in dire need."

## Audio File 28

28-00:00:00

Rubens:

So Peltason has called you. He didn't come down and knock on the door? He calls you?

28-00:00:13

King:

I think he called, yes.

28-00:00:14

Rubens:

And asks, "Will you take this position?"

28-00:00:18

King:

Yes, on an interim basis because they had been presented with a situation, a need to do it very soon. That's unusual, because Walter had announced this no more than a month before he started [at] Morehouse. Actually, what I don't remember specifically is whether Walter made this announcement before or after July 20th. I think it was before. But it's quite possible that Peltason had not come to me before July 20th. July 20th is the date of the regents meeting that passes the two resolutions.

28-00:01:03

Rubens:

Wow. So how long do you have to prepare for this?

28-00:01:09

King:

I have about two weeks to prepare for it.

28-00:01:12

Rubens:

And did that include having to find a successor for you?

28-00:01:16

King:

That included that problem, yeah. And I did come up with one who was—now, let's be careful here. Now, actually, what we did for a successor to me was to ask Carl Poppe to do it. Carl was in what had been the Jim Kane job. Tommy Ambrose had left. This is the national lab job. Tommy Ambrose had left, Dick Kropschot had left and we had gone to a two person organization, which would be a person in the office of the president doing the academic oversight plus Elaine {Stamman} as support staff. And Carl, who was a lifelong Livermore employee, was in that position and we started off with him being the acting vice provost for research. After a while, Carl and I recognized that we also needed someone to focus on the UC, non-lab portion of the Vice Provost position, and I added Sandra Weiss, a recent ex-chair of the Academic Council, for that.

28-00:02:22

Rubens:

Well, I assume you had an agenda that you were pursuing in your position.

28-00:02:36

King:

Well, yes. I really had to give that up, that agenda. It would not work to dictate what is done in the office of research from the position above it. I had to leave Carl his running room and just let him and then Sandra go with it.

28-00:02:58

Rubens:

So you know that the primary job that you have to do is to really back up the president and deal with this issue of the challenge to affirmative action.

28-00:03:11

King:

Well, I have to learn on the ground what a provost does at the system level. I knew what a provost did at the campus level but the function of the system level is totally different.

28-00:03:23

Rubens:

Why don't you lay that out.

28-00:03:25

King:

Oh, well, at the campus level you were dealing with deans and through the deans with faculty and it's a heap of faculty issues that you are dealing with one way or another. And you're doing budgetary allocations to the different units and you are assessing personnel cases and that sort of thing. At the system level you don't have faculty reporting to you. You do have to work with nine and then ten people who are doing that campus job of provost and work very closely. But, again, you have to deal with policy issues. You have to deal with whatever is bouncing around from the legislature or from the regents. The issue of the day, so to speak, and, of course, the issue of the day was affirmative action. There's no question about that. But it's just not the same job description at all as the campus one.

28-00:04:32

Rubens:

And did it mean meeting with the president right away?

28-00:04:37

King:

Oh, sure. Yes.

28-00:04:38

Rubens:

And why was it interim?

28-00:04:42

King:

It was interim because they want to do a search for the permanent one and the search for a provost at the system level is done the same way as the search for a campus chancellor. It's a committee that's half regents, some senate people, some this, some that. There was a lab director on the committee that was searching in my case. Bruce Tarter [Livermore] was on it. So the search actually took until March. So from August 14th until March, the March regents meeting, I was an interim provost, which was longer than expected but then these things always take longer than expected. And then as a result of that search is when Dick came to me and said, "I want you to be permanent provost," and that [appointment] went to the March '96 regents meeting.

28-00:05:43

Rubens:

So shall we talk about how you're going to attack and in general what's going on regarding the affirmative action motions? We mentioned the Cook's but we should lay it out about what sets this whole thing in motion.

28-00:05:56

King:

Yes, we should lay it out. Well, what happened here is that the University of California, in of and by itself, was put in the position of not being able to use any considerations of race, ethnicity, gender, et cetera, et cetera in admissions or employment and that was the essential content of regents resolution SP1 and SP2. There's one other piece of very essential content, which we will get to, and that's the last clause of regents resolution SP1, which is that there should be a massive effort to improve the abilities of all people to qualify for and gain admissions to the University of California. That is what led to the outreach taskforce and to outreach, which is a huge endeavor and I'm in the middle of that, too. But—

28-00:07:01

Rubens:

Didn't Bakke in '78 put an end to—

28-00:07:13

King:

Bakke certainly put a definition on it. It was a rather strange definition because Bakke was a split decision and the swing vote, the final vote to make it go the way it went was cast by Justice Lewis Powell and it is Powell's statement that is taken as the Bakke decision. Yet it's the expressed opinion of one justice, not of nine. So Bakke, with the awkwardness that that situation gave it, was the interpreted law of the land at that point.

How this came about was that a new regent, Ward Connerly, adopted this as his issue and during that year—I believe he became a regent as of probably March '94. Terms begin and end in March. Connerly became a regent in '94 and took up very fast with the issue of whether there were inappropriate preferences being given in admissions. The Bakke argument, which was made often at regents meetings by Walter and by Jim Holst, who was regents general counsel, really didn't carry the day with Ward. It was his view of what was the right thing to do and what was the wrong thing to do ethically. And so Ward, supported by some other regents, kept asking for reports on the admissions policies of the University of California and how it was implemented operationally. And so these were the three or four reports that Walter Massey delivered to the board of regents during the '94-95 year. As I mentioned earlier, I was part of the rehearsal committee for him. These reports then led to a lot of regential discussion and were generally reacted to by Connerly and some others as being inadequate explanations.

However, at this very point in time, around May of '95, Governor Pete Wilson has thrown his hat in the presidential ring. The governor is also the president of the board of regents, so he has a role—he has a right to come to any regents meetings he wants. And working I think very closely together, Connerly and Wilson devised what became regents

motions SP1 and SP2, which were the ones that say no preferences in admissions, no preferences in employment.

Those motions arrived over a very short period of time. That is, we had had a May regents meeting. I think there's not a June regents meeting. There was a July regents meeting. As of the May regents meeting, it was not apparent that Connerly and Wilson would be putting these motions to the July regents meeting, which is in fact what happened. Jack Peltason was very busily trying to iron this out and keep anything dire or drastic from happening. I was not privy to the very internal discussions as to—so I can't address what Peltason thought with regard to what might happen. It was only a couple of weeks before this meeting of July 20th and it became apparent that a drastic set of motions was going to be set on the table.

So we came to the July regents meeting, which was held at Laurel Heights where all the regents meetings were held in those years. Laurel Heights in San Francisco. Once or twice a year they might go to a campus but it was lessening. And every other meeting was held at Laurel Heights in this underground auditorium that was there.

So for this particular regents meeting, we were all instructed that we could not drive our cars to the meeting. You had to drive your car to the Parnassus garage at UCSF and then a shuttle bus would take you to Laurel Heights so as to keep traffic and cars away from all of this. There was large television coverage, as you may remember, including—I think it was live on channel nine, the whole thing. And it started at 8:30 or thereabouts. Jesse Jackson was there. I sat four seats from Jesse Jackson. He's bigger than I am.

28-00:13:14  
Rubens:

He came to this on his own or was there outreach on the part of—

28-00:13:18  
King:

Well, there was some organizing obviously. We will get to the point where the organizing took effect. So he was there. He talked. Many politicians from here and there spoke. Willie Brown gave what I remember as a very reasoned address on it. So we went through hours of speeches and then the introduction of the resolution, discussion of the resolution. We were at something like seven o'clock in the evening and still going when Jackson made a signal and a movement was made by a number of his colleagues to shut down the meeting. And so the meeting was shutdown. But the university had prepared for that eventuality and there was another room upstairs in the Laurel Heights building completely outfitted for a regents meeting, looking very much like the room we were in, to which the whole thing moved. The difference being that the public was present as long as it was in the

auditorium and once it went to that special room it was not [available] to the public and I guess that's something the university could do because of the meeting having been shut down by external forces. That then gave the right not to admit all the public to the rest of the meeting.

28-00:14:55

Rubens:

How did they literally shut it down? Do they just become disruptive?

28-00:15:01

King:

Yes. [They] Moved up and took over the regents table, stood all around it to prevent people from doing things.

28-00:15:08

Rubens:

Really? And no security guards or police to—

28-00:15:11

King:

Security guards came in and the room was evacuated. There were, however, three of us who didn't make it out and so we stayed in during the shutdown and only got to the rest of the meeting later. The three of us who were caught in there were myself, Chuck Shank (the director of the Lawrence Berkeley National Lab) and Dorothy Bainton, who was the vice chancellor for academic affairs of the San Francisco campus. All three of us remember it well.

28-00:15:43

Rubens:

Was it a little scary?

28-00:15:44

King:

It was a little scary. So I got up late as a result of this to the room where the meeting was playing out. And it's about 8:30 in the evening that the motions were passed and adopted. And with that, I remember going out on California Street with Bainton. It's after dark at this point and no shuttle bus, so how do we get back to our cars which are up at Parnassus? Finally [we] took a cab. So anyhow, it was a very public meeting, a very contentious meeting, and a very public passage of these resolutions. I do believe that a very essential part of that story is the fact that the Wilson presidential campaign was going on at the time and that to have done this was a valuable thing to him in his campaign at that point. He withdrew soon thereafter but it was just a very short term coincidental timing of those two things.

28-00:16:55

Rubens:

To situate this story, especially regarding Wilson —the Cooks are from San Diego. Well, we should say that their concern is that their son—

28-00:17:06

King:

The Cooks really touched the issue off. They had a son who had been denied admission, not to the undergraduate class at San Diego, but to the medical school. They somehow got hold of a plot of scores on tests



versus who was admitted and who was not and sent that, distributed it widely, and in effect Ward Connerly and the governor picked up on the Cooks case.

28-00:17:45

Rubens:

Were they political supporters or donors to Wilson?

28-00:17:53

King:

I don't know. There are two books. One is called *Burning Down the House* and is by a professor, Brian Pusser. Pusser from the University of Virginia. And the other one is by Lydia Chavez. It's her tenure piece for the School of Journalism. [*Color Blind: California's Battle to End Affirmative Action.*]

28-00:18:36

Rubens:

And then John Douglass's book, which has a brief on the events leading to it, which is very useful.

28-00:18:51

King:

But the Cooks were the source of the data that touched this off. And those data were always there lurking on the scene during all of Walter's presentation. So he would be asked questions about how the Cooks' data comported with what Walter had described for admissions policy. He'd have to start by saying, "Well, that's medical school and this is undergraduate." And medical school admissions are different in some ways.

28-00:19:25

Rubens:

Because?

28-00:19:26

King:

Because you can bring in an element of who can serve the populace best. Affirmative action, even with the present laws of California, can stay in medical admissions a little more than it can in just ordinary undergraduate admissions.

28-00:19:43

Rubens:

Now, there was a big flurry about the office of the president getting running their own data. Or wasn't it that the Cooks kept—not subpoenaing but requesting the university data and—

28-00:20:01

King:

Yes. I think that is true and there was a lot of generation of data within the university and those data formed the basis of Walter Massey's presentations to the regents. But anyhow, the upshot of all of this is that as of July 20, 1995, the university now had these two regents' resolutions which specified points in time when these factors could no longer be considered in admissions and it had a very short timetable with regard to changing itself and its policies to meet those conditions. And I remember very well starting as acting provost August 14th. So

we can compute how many days that is after July 20th but it's darn soon. And we were in the situation where we had to change policies. We were in a university that itself did not comport—did not agree well with the regents' resolutions. Certainly everything that was said publicly by faculty and what was felt very internally and very strongly by many faculty was that the affirmative action was the right thing to do—the way it had been done with the preferences. Yes, there's a body of faculty who feel otherwise and who felt otherwise at the time, but they have not been as vocal or as strong in their statements as that other side. So here was a university that was both split heavily on the issue and in terms of most of what was felt and said very much against these two resolutions.

28-00:22:22

Rubens:

And I thought also, in keeping with one of your original goals when you had come in as head of research, that the issue sort of created a kind of unity between the office of the president and the campuses; that is, the Academic Senate usually had been in charge of setting admission standards.

28-00:22:46

King:

That issue was there and that issue was complicated by the fact that regents general counsel, through Jim Holst, rendered an interpretation that admissions policy was not the sole purview of the faculty, which was very counter to what the senate thought was its role and position. So another part of this was defusing that conflict, not letting that dominate things. So we had to devise a way of moving ahead that would deal with all of these complexities. There was yet another complexity, which is that we had a lame duck president and we did not have our new president there and in office until October 1st. So there's a period of a month and a half there where surely, [for] anything that you do, you ought to have the new president comfortable with it and the result of it is not much happened during that month and a half.

28-00:24:01

Rubens:

Tell me about defusing. What was your role in that? What were seen as measures to do that?

28-00:24:09

King:

Well, so we had to do two things straight off the bat. Let me say those and then I'll get back to the first one of these that you asked about. The two things we had to do right off the bat was decide what approach we would take to the change in admissions policy and the implementation timetable for it. I'll get back to that one. The second thing we had to do was move down the path of addressing outreach. And that clause that I mentioned in regents resolution SP1 specified that there would in fact be a taskforce to deal with that. So we had to move down the road

of an outreach taskforce. Those were the two most immediate things to be done.

Now, back on the first of these. And it relates to your question on defusing the issue. We formed jointly with the leadership of the Academic Senate a joint senate-administration taskforce to address the issues of the ways in which we would make the changes. This didn't yet address the issue that went on all the following years of how do we change our criteria for admissions. It was instead the question of how to deal straight off the bat with the inability to consider race, gender, national origin, et cetera, and how to get that straightened so that we wouldn't be breaking the law, the regents' policy. I should mention another complication, which is that already on the table at that point was the state ballot proposition, Proposition 209, I believe, arrives about a year and a half later, in November, 1996.

Sp1 and 2 come in July '95, I guess a year and four months before Prop. 209 comes in. But the specter of 209 was there, what would it say, how might it be different from SP1, SP2. And the other thing that 209 did was to change this whole situation from one of being the University of California hanging out there by itself to one of the whole state and therefore also the CSU and the community colleges. So it was particularly difficult during that first sixteen months when we're out there by ourselves. And it created a very difficult situation because we were the only ones who could not consider these things. Stanford could. CalTech could, USC could and [they] did. CSU could until sixteen months later.

28-00:27:23

Rubens:

Under Prop 209.

28-00:27:26

King:

We were the only ones—

28-00:27:27

Rubens:

So what were specific strategies used to defuse?

28-00:27:35

King:

The joint senate-administration taskforce and in that way having the senate and the administration—and that includes administrative people from campuses—working together in concert, in constant discussion. So if they can reach agreement on what to do, then there's not an issue of who's bailiwick it was.

28-00:27:56

Rubens:

Would you just remind me who makes up the Academic Senate? How is it composed?

28-00:28:09

King:

It's time for my diagram. I'll give it to you after our session if you'll remind me. I actually have a four color diagram that explains all of this.

28-00:28:18

Rubens:

Okay. We'd love it. We'll put it in an appendix

28-00:28:19

King:

I use it in my courses. It's got to be in color.

So anyhow, the senate is composed as of many divisions of the senate as there are campuses and so there's the Berkeley division of the Academic Senate. And it has committees and it has a leadership and it has a governing council. The campuses are not all set up the same with regard to that but they have some form of campus governance and all of them have a division chair of the Academic Senate. Then, at the system level there is the Academic Council and the Academic Council has similar structure. The Academic Council is its name, which is made up of some sixteen people. I think it's now up to twenty. And then it has a whole bunch of committees. And the Academic Council is composed of the chair of each of the ten divisions of the senate. That's ten members. Then an elected Academic Council chair, which Neil Smelser and others have been. A vice chair who will be the chair the following year, and then in my time there were six committee chairs who were members of the Academic Council. That's the number that I think may have grown some. So the Academic Senate operates at both the system and the campus levels. In this case, the committee we set up had people designated by the Academic Council, the system wide body, and then had administrative people from both OP and the campuses. It had co-chairs. They were Dennis Galligani, who was the assistant vice president at the time for student affairs and had admissions under him, and Arnie Leiman, Berkeley professor who was the chair of the Academic Council at that time.

28-00:30:39

Rubens:

Now, was there something that you, in retrospect, think the system could have done that could have defused this more or really persuaded the regents in any way not to do this?

28-00:30:55

King:

There is one thing that has always bothered me. Since I was not involved in the discussions at the time I don't know the situation well enough to make a pronouncement. But it always seemed to me that during the months leading up to these motions on July 20, 1995, that the Academic Senate was remarkably absent. Here the senate has admissions policy as one of the things expressly delegated to it by the regents and here this thing is being developed at the level of the

regents with the wording being developed by the regents. Why could not the senate take the position that this is our purview, this must come to us to study and make recommendations.

28-00:31:50

Rubens:

And they didn't do that? Not to the extent—

28-00:31:53

King:

I don't think that happened. And that would have been a way of dealing with it. Of course, you've got the fact that the senate is the senate, the administration is the administration, the administration doesn't tell the senate what to do so it couldn't have been done that way [i.e. telling the senate what to do].

28-00:32:13

Rubens:

The nature of shared governance.

28-00:32:15

King:

But the admissions one, not the employment one, was so much the purview of the senate on admissions policy that I think a good approach could have been just simply to assert that role, which could have been done by one or both of the two faculty reps to the regents. And incidentally, the one who was chair is a very good friend of mine.

28-00:32:50

Rubens:

That was?

28-00:32:50

King:

Dan Simmons. But it seemed to me that the senate could have tried to assert that they should have taken this for four or six months of study. I think that would have swung regent votes enough so that it would have been referred to them [the Senate]. It was a pretty close vote anyhow. And then if the senate had done all of that studying and came out with this, that and the other thing that were these additional factors and you must think about this and so forth and so forth, it might have made a considerable difference.

28-00:33:28

Rubens:

There was such a rush to get this done. Could Peltason have said, "We just need more time."

28-00:33:35

King:

Peltason tried to push it back but I think the thing that was ultimately the irresistible force was the fact that Pete Wilson was running for president and this was a useful thing for his political position to have done at that time.

28-00:33:55

Rubens:

Right. So it was a steamroll.

28-00:33:55

King: That set the schedule.

28-00:33:57

Rubens: John Douglass has a statement that I don't quite understand the background of. He thought that despite the pleas of the university, of Peltason, that the regents really had become more engaged in university policy, perhaps as a reaction to a sense of being over-managed by university administrators in the past.

28-00:34:23

King: Notably David Gardner no doubt. [laughter] Well, I think that's the implication, yes, because David was an absolute master of working with the regents. And I suppose somebody who wanted to put a negative light on it certainly could say that he managed the regents. But it [i.e. David's work with the Regents] was done in a very positive and very effective way. Yes, I don't know from firsthand experience if that's the case but I wouldn't discount the possibility.

28-00:35:01

Rubens: In retrospect, you think Peltason was strong? There's no second guessing what he could have done?

28-00:35:13

King: I think he did the best he could have done. Although it would not be impossible for him to go to the chair of the Academic Council and suggest why don't you think of—

28-00:35:30

Rubens: To your knowledge that didn't happen?

28-00:35:31

King: I don't know.

28-00:36:07

Rubens: They say the regents wrote SP1 and SP2 but who—did they have a staff assigned to them or is it the counsel's office or—

28-00:36:17

King: Well, there is a secretary of the regents. It's changed a little now. But there was in those days a secretary of the regents. She was not involved in the political discussions at all. That was Lee Trivette. And [there was an] assistant secretary of the regents, who was Anne Shaw, and ditto. They would not be involved in the discussions at all. So there was nobody at a staff level to staff such deliberations of the regents. That really is the role of the president's office, or was in those days. The regents do now have a staff, a small staff, but in those days they did not. And the staff of the regents, in every sense of the word, was the president's office. To put the issues before the regents, here

are the pros, here are the cons. But, of course, SP1 and SP2 did not work that way.

28-00:37:13

Rubens: Right. So it's July of '95 the decision is made. You need to now—

28-00:37:18

King: In fact, that's why they are SP1 and SP2. The SP is [for] special, which means that they were motions put on by a regent. Ninety percent of the items are put on [the regents agenda by the president.]

28-00:37:34

Rubens: Oh, that's a good distinction to make. Special motions. So did you have a timetable with which you had to get the—

28-00:37:46

King: Yes. The regents' resolution states a time at which these factors could no longer be considered in admissions. I unfortunately did not prepare myself by looking once again at SP1 and SP2, which I'm going to have to do.

28-00:38:03

Rubens: Sure, we'll come back to this topic. I haven't read the *Burning Down the House* book, which I will.

28-00:38:15

King: That actually has the wording of SP1 and SP2 in the book. And that's what I will need to look at, too. But there was a huge issue there which we will get to, which is that the president decided he wanted to delay the implementation and thought he had the agreement of the regents and most certainly did not have the agreement of the governor, who came down on him hard. But let's give that one the justice it needs. And I need to have looked at the dates before we do that.

28-00:38:50

Rubens: So let me just think if there's anything else that I wanted to ask you about. I'm look at my notes. Until we take this topic up again, should we talk about your being chair of UC Press?

28-00:39:15

King: Oh, I'd be glad to talk about that. There were several things that came to me as ex officio functions that were associated with being provost and most of them are quite enjoyable. One was to chair the board on the UC Press. It also put me in the position of selecting the director and all of that. I had the same roles with regard to Continuing Education of the Bar, which is quite a large enterprise. And I had responsibility for the Keck telescopes.

28-00:39:53

Rubens: Which we did talk about.

28-00:39:54

King:

—which eventually became a matter of my acting in them. I hired a vice provost for research by giving him the role with the Keck telescopes when I hired him. That was Robert Shelton. But then later on I took those roles on myself. So I had that.

And then the most interesting one of all, which we need to spend some time on, was the day I came into office on August 14th. First thing I thought I should do is review my calendar for the next several days to see what it was I was in fact doing. And here was, I think it was Friday of that week, x'd out with these words AUAC written through it. And I inquired about that and was told, "Oh, that's the American University of Armenia Corporation. You're chair of the board."

28-00:40:49

Rubens:

Oh, that's how that comes about.

28-00:40:52

King:

[laughter] And I've been involved with it ever since and still am. And I'm about to go there [i.e. to Armenia] again.

28-00:40:56

Rubens:

All right. So we'll have to take that up separately.

28-00:40:59

King:

Yes.

28-00:41:00

Rubens:

Tell me about your calendar then.

28-00:41:05

King:

Once you get into that position, you've got a calendar that's ready-made and you have to rely on the person who is accepting appointments to know enough about what's important and what isn't important to make the right judgments on that. My calendar was no longer my own when I got to that position.

28-00:41:24

Rubens:

And can you talk about your workday? It probably varied and of course these meetings, the regents meetings went on.

28-00:41:32

King:

Well, of course, the first problem when I went to OP is do we, Jeanne and I, move. So we have for a very long time now, since 1969, lived in our home in Kensington north of campus. We made the decision we are not going to move. Of course, we might have had to move if one change hadn't happened because back in Bill Fraser's day there was a university house for the provost. It was called Morgan House. It's designed by Julia Morgan. It is at the corner of Claremont Boulevard and has a long sort of yellowish front, with tiles. That was the provost



house. Bill Frazier used to entertain national lab people in it. It was bought for the provost to entertain in and that's where the Frasers lived. And it was as of the financial crises of the early nineties and this transition team—the decision was made to sell that house. And so the Masseys didn't live in it. We didn't live in it. So I have through it all lived in the same home in Kensington, about three blocks up from the Blake Estate. And so getting to the office of the president was a forty minute drive. You had to allow forty minutes.

28-00:43:12

Rubens:

I know it's not easy. Really there's no reason to take the freeway, right?

28-00:43:17

King:

There are many ways of doing it. We can spend a session on ways of getting to Oakland if you like. There's nothing very straightforward about it. And given the fact that traffic can tie up and that you do have to park before going into your office—if I had a nine o'clock appointment, I had to be out the door by 8:15 or if I had an eight o'clock appointment, out the door by 7:15. So there was significant driving on either end of it, which was a time to think about what the issues would be for the day and what the issues had been for the day.

28-00:43:56

Rubens:

You weren't working on cell phone in those days either.

28-00:43:58

King:

No, there was no cell phone. I had a car phone and I'm trying to remember the particular time this became interesting. Must have been a very early cell phone. The time I'm thinking of was in August of 1995 when I'm driving on Route 280 up or down the peninsula between San Francisco and Palo Alto and the phone rings and it's Jack Peltason. It's my boss. I'd better have a good conversation with him. He too is on a cell phone. We couldn't hear one another at all. Just simply had to hang up. [laughter] That's an early cell phone.

28-00:44:47

Rubens:

Those were big devices too, right?

28-00:44:48

King:

Yes.

28-00:44:50

Rubens:

It's close to 4:00. Maybe we should stop now.

28-00:44:59

King:

Yes. I'll get ready on the way we play the SP1 and SP2 [going] forward, where I do need to do some reviewing.

28-00:45:09

Rubens:

Did you meet with the council of chancellors, too?

28-00:45:13

King:

Yes. Oh, yes. A hundred of those. I did a hundred regents meetings. I did a hundred council of chancellors meetings.

28-00:45:28

Rubens:

Well, because they take place the same day. Is that right?

28-00:45:33

King:

Council of chancellors was the first Wednesday of each month. The regents, in my time, were I think eight meetings a year held in that week of the month which contains the third Friday but held on Wednesday and Thursday. [laughter]

We really have to do more on affirmative action.

28-00:46:10

Rubens:

We will.

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29-00:00:03

Rubens:

We left off at the last interview considering how you hit the deck running with your position as vice president of the whole system, dealing with the issue of the day, which was affirmative action. You talked about how immediate and politically responsive the kinds of administrative decisions you had to make were, both in your previous position and as you came into the vice presidency—it was fast and furious and intense.

29-00:00:53

King:

It was very fast-moving. The time intervals set by the regents in that motion were actually very short. No preferences [to be] exerted after January 1, 1997. That was not even a year and a half away. Yes, we had to move fast. I mentioned a joint senate-administration taskforce that we set up very early on. That was for the express reason of seeking an agreed path forward to make the immediate adjustment to SP1 in particular. SP1 was the one that dealt with admissions. We had to move on different timetables, because we knew we couldn't just make simple adjustments in response to those regents' motions. We would have to do much deeper studies, much deeper considerations, later on. In fact, we were waiting for one of the Post-Secondary Education Commission's eligibility studies. They do these about every four to five years. They did them, I should say, because there no longer is a Post-Secondary Education Commission as of the latest Governor Brown budget. There was then. One of their roles was to do these eligibility studies. What they would do is go out to the schools and see who was eligible, in fact, by the current criteria for CSU and for UC. Then they would, in effect, add those data up for the state and come up with an estimate of what percentage it was that was actually eligible for UC by the criteria, vis-à-vis the target of 12.5 percent.

29-00:02:58

Rubens:

Vis-à-vis the old criteria.

29-00:03:02

King:

Well, the target is 12.5 percent eligibility. Twelve-and-a-half percent of public high school graduates. Since you set, as your criteria, test scores and grades, you don't know that that's going to equate to 12.5 percent, and things change over time. That's why this calibrational study is made by CPEC every four or five years, and they would come up with the results. So we didn't know whether we were over-eligible or under-eligible. That is, whether it was 14 percent eligible or 11 percent eligible. Changes we would make would have to take that into account. We had to wait to do the bigger changes until we had that

CPEC study. Then there were very fundamental questions and issues that had to take some research and a lot of staff work before we could address them. That first taskforce was just to get the immediate compliance in place.

29-00:04:10

Rubens:

Organizationally, what did that literally mean? You co-chaired that taskforce?

29-00:04:14

King:

No, I didn't. Dennis Galligani, who was, at the time, assistant vice president for student affairs, co-chaired it with Arnie Leiman. Arnie Leiman was the chair of the Academic Council at the time. It was those two. I obviously worked very, very closely with Galligani on that, but those were the two co-chairs. That was, as I said, the immediate adjustment.

29-00:04:50

Rubens:

Did they set up an apparatus, then, or were they just waiting to have a way in which they would process the data that would come in?

29-00:04:59

King:

They looked at what were the UC requirements for admission on the various campuses. Maybe it will be helpful if I back up for a moment and talk about the difference between eligibility and admissions, because these words will get into this frequently. Where UC is, is that there is, specified through the master plan, a target that 12.5 percent of public high school graduates in California will be eligible for UC. There are two other corollaries to that. One is that you set up a set of requirements that should equate to that 12.5 percent. Then, whatever those requirements are, you apply the same requirements to the private high schools. That's how they [private high-school graduates] get into the picture. We do that through recipes based upon grades in courses in the college-going courses, which are the so-called A through G courses that the university requires that students take in high school. It becomes a combination of your A through G course grades and your SAT scores. What grades and what combination of test scores and grades changes over the years as adjustments are made. That's what determines eligibility. Now, the second thing that I wanted to remember is that one of the reviews of the master plan, after it was first created, added an understanding that if you are eligible, there will be a place for you. Now, we're in a situation where you determine by these criteria who is eligible, and then those who are eligible are guaranteed a place. Not necessarily at the campus of choice, not even necessarily in the major of choice. So that's what eligibility determines.

Now, admission is the next step. We've guaranteed a place to all eligible students, but they don't distribute evenly as to what campuses they want to go to. There are some very popular campuses. There are some not-as-popular campuses. Berkeley and UCLA would, in those days, typically receive applications from five times, or even more times, as many eligible students than they could accommodate. So they have to select among the eligible students as to who they will admit. I'll add the other thing that happens here to make it understandable. That is, when an eligible student is not admitted to any campus to which they applied, they are then part of what is called the referral pool. There is always at least one campus open that is willing to take the referral pool. In my day, there were two campuses. They were Riverside and Santa Cruz. Today, it's just Merced. There will always be a campus open so that, indeed, there is an offer of admission somewhere to every eligible student. Admissions became touchy because of the great intensity of the application pressure on the campuses like Berkeley and UCLA, and to a lesser degree, some other campuses. Therefore, campuses had set up their own admission criteria for choosing among eligible students to admit.

29-00:09:06

Rubens:

When are we talking about, roughly? Heyman is tinkering with this all in the eighties.

29-00:09:13

King:

Yes. Berkeley became impacted, I think, in the seventies. Possibly the late seventies. Actually, when I came here, it was remarkable. An eligible student could apply for Berkeley, and they could come. There wasn't any other process. This great impaction, as it's called, of having way more applications than you have spots, started back then, I think, in the late seventies, and just grew and grew over time. All during the eighties and nineties, a big issue was, what are your admissions criteria? Various things were set up for that, and they differed from campus to campus. With regard to attentiveness to race in the admissions process, the eligibility criteria have never had any attentiveness to race, except possibly for one recent change that has been made, which has fuzzied up the eligibility to give a comprehensive review to a group of students that are on the lower edge of eligibility. Still race, of course, cannot be used, but things that relate to disadvantage in educational opportunity can be used there. In my day, it was just test scores and grades, and that has no racial component or gender component or any other component. So eligibility was, in that sense, not the issue—admissions was. Various things went on. Both Berkeley and UCLA had forms of matrices, which considered academic record on one axis, degree of disadvantage, with race being an explicit factor, on another axis. Then we also had some campuses—I think it may have been Irvine and

Davis—that were admitting any eligible minority student, underrepresented minority student, and were not admitting all eligible students in other categories. Therein was the issue that spawned SP1 and SP2, was those admissions policies.

29-00:11:42

Rubens:

We talked about the political climate last week, about the driving force being Governor Wilson, who wanted to use this as an issue in his campaign.

29-00:11:55

King:

I think there were two driving forces, and they're difficult to pick apart. That is most certainly one, the fact that there was a Wilson presidential campaign in full gear then. The other is that this is a heartfelt issue with Ward Connerly, as you can see from his entire career. He, all along, made a number of statements that made it quite clear that he was proceeding from principle. You then have to try to differentiate those two factors. I know there are a number of regents from that time who think that SP1 and SP2 would not have passed had there not been a Wilson presidential campaign and the pressures that went with that.

29-00:12:44

Rubens:

Including, I heard, that many thought that there really weren't the votes to pass it, but Wilson basically worked through the night, twisting the arms of—

29-00:12:57

King:

We don't know the degree of that, but of course there was some component of that sort.

29-00:13:05

Rubens:

Because ultimately, it was kind of a close vote. Fourteen-ten.

29-00:13:07

King:

Yes, it was a relatively close vote. I think the point here is that the presidential campaign and the pressures from the governor that went with that were what made the difference was in swinging something that might well not have passed. It did pass by that margin.

29-00:13:30

Rubens:

Plus, I think also a general social, cultural climate that was very anti-immigrant, that was really concerned about the changing complexion of the student body.

29-00:13:44

King:

There's no question about that. There were various initiatives, other initiatives, on the ballot that tested those same waters in about the same period of time. English-only in schools was one of them, and there were others. Yes, it was a huge political issue. I've read a

number of analysts who believe that it was the perfect wedge issue in the sense of Wilson being able to come forward with an issue that would split his opposition, with regard to it split the Democrats and split the rest of the Republican Party, which would be to his advantage for gaining the nomination.

29-00:14:33

Rubens:

Okay. So where this conversation came from was your initial committee.

29-00:14:40

King:

From the initial committee, we found out sort of the mechanics of what had to be done to comply. They also made some more far-reaching considerations. One thing I realized, again, in going back through this, is that in fact the idea of comprehensive review comes from that committee by origin. They put that on the table very early on.

29-00:15:06

Rubens:

Just say, for the record, a word about what comprehensive review is.

29-00:15:10

King:

Considering many different factors for admission. When we get to comprehensive review, as it was adopted by the university, there are fourteen factors that may be considered in the admissions process. Two of these are grades and test scores. Then twelve other things.

29-00:15:33

Rubens:

Of course, it won't be so long before eligibility being determined by SAT scores is going to be challenged, with the charge that they really were racially biased.

29-00:15:48

King:

That was being challenged at the time. Yes, there was a very strong contingent, particularly in the Hispanic community that felt the SAT discriminated racially, if for no reason other than the question of first language.

29-00:16:07

Rubens:

All right, so you're talking about what you're overseeing. Your initial response is this committee, the taskforce.

29-00:16:16

King:

Yes. We then had to come to grips with the question of what timetable things had to be done in, and the sequenced aspects of it. It became quite clear that it would be somewhere between impossible and exceedingly difficult to meet this January 1, 1997 deadline, which would mean that [as of then] you could not give preference. You had to change your entire admissions procedure for the class that would enter fall of 1997. Dick Atkinson became concerned about that and

started working regents on the issue. That this was just too soon, considering the size of what undergraduate admissions are, and all the things that have to be printed up in advance, and when you have to print them, putting out information to schools that is proper information with regard to what it takes to apply and what the criteria would be.

29-00:17:25

Rubens:

When you say “working regents,” what literally—

29-00:17:28

King:

Talking with regents.

29-00:17:29

Rubens:

Individually?

29-00:17:30

King:

Individually, to see if they might see this point. The next thing that happened, which was along about November and December—I guess in January also—was that Dick concluded that he had a sufficient number of regents to do the delay. He then proposed that, and there was an immediate and quite strong reaction from the governor. I remember our brand-new administration clustered in there on a Saturday morning and on into the afternoon, laboring away with Dick on what might be done with regard to the stance the governor was taking on this. That was not a good scenario. Eventually, the pressure from the governor was so strong that Dick had to write a letter acknowledging that the regents rule the university, the president executes what it is the regents have decided, et cetera. With that, I guess the point of principle having been made with the governor, then, at a regents meeting early in '96, probably January, the regents did pass that extension for undergraduate admissions. The compromise was that graduate admissions would not be extended, spring admissions would not be extended, but the big bulk of admissions for fall would not be put on a race-free basis for fall '97 entering students, but for fall '98.

29-00:19:27

Rubens:

Now, may I just ask you a few questions to illuminate more about this very tense time? The governor basically, per my understanding, wants to call in Atkinson and give him a dressing-down.

29-00:19:43

King:

Yes. We got phone calls from the governor's office when we were sitting there that Saturday morning. I remember that. There was also another intermediary. John Davies, a very sensible, good regent, was very close to the governor and actually served as his judicial appointment secretary. Davies is a lawyer. The traditional appointment



secretary handles all the judge appointments and the things that go into them.

29-00:20:15

Rubens: Are you advising Atkinson on what this letter is going to say? Was there some conflict?

29-00:20:28

King: There was not much flexibility on the letter. It was indicated what was wanted.

29-00:20:34

Rubens: By them. Because that's part of the initial debate over SP1 and [SP]2, that Connerly is saying that the regents govern the university, not the president. Then there's Brophy I think.

29-00:20:53

King: Well, and then there's the senate side of that, too.

29-00:20:55

Rubens: The senate is saying, no, that's a violation.

29-00:20:59

King: Another issue at the time was, does shared governance apply just to the administration and the senate, or does it apply to the regents and the senate?

29-00:21:08

Rubens: Right, right. Could Atkinson ever have said, either Connerly is the president or I'm the president; you choose? Would that have just been foolhardy?

29-00:21:21

King: It was quite clear that he would be relieved of his job if that happened.

29-00:21:25

Rubens: And he wasn't willing to do that?

29-00:21:31

King: If you look at what was done, the desired outcome was achieved, because the following month, the regents do agree to delay the implementation of SP1 for a year, for the fall admissions. In effect, Atkinson got what he was trying to get. The governor got what he wanted, which was an acknowledgement that the regents have authority for the university. Which they do. The text of that letter, incidentally, is in several books, one of which is this Burning Down the House. The letter was made public.

29-00:22:16

Rubens:

Of course, Atkinson isn't on board when the fateful regents' vote takes place, July 20. Could Peltason have said that too? Either I'm the president or Connerly is the president?

29-00:22:33

King:

Jack never worked that way. He isn't that type of person to do confrontations. He is a person who works by negotiation, consensus, et cetera. Look, if you look at the legal question of who has ultimate responsibility for the university, it is the regents. Any legal study would show that, just by the wording of the documents that set up the university.

29-00:23:08

Rubens:

Finally, Atkinson gets what he wants, the delay, but there's the whole underlying issue of how do you diversify the system. I don't think that word was used.

29-00:23:19

King:

Well, yes, and that was the next decade, was how do you diversify the system.

29-00:23:25

Rubens:

And you think Atkinson had a real commitment to it himself?

29-00:23:28

King:

Oh yes.

29-00:23:29

Rubens:

No question about that?

29-00:23:30

King:

Yes, no question about that. I think the chancellors, too. Every one of them. The demographics of California are changing enormously, and they were changing enormously then. De facto, given what existed at the time, we had a situation where this very rapidly growing section of the population had very little partaking of the University of California. That could be called de facto segregation, because you're going to educate heavily one portion of the population, not educate heavily another portion of the population. De facto segregation is not good for the state. People have to be in a situation where they can all rise to the same opportunities and do what they can do and achieve what they can achieve. In some way, a situation had to be set up to enable that. Our challenge as we went into this after SP1, SP2, was to find a way to do that, abiding by the language of SP1 and SP2, which said no consideration of race, no consideration of gender, no consideration of religion, no consideration of national origin, et cetera. Yet what was there that we could do that would serve to accomplish this diversification? The regents had addressed that question in their motion, in a way. I said last time it was the last clause of SP1. It is, in

fact, the first clause of SP1 that says there shall be a massive outreach effort and there shall be an outreach taskforce. The answer in the regents resolution was, do it through outreach. Through preparing students, in the high school years and earlier, to enable them to compete equally for spots in the university.

That was the regental answer. Everyone knew that outreach, defined in that way, was a giant job that would take generations to accomplish, if it was accomplishable at all. It's not very pragmatic with regard to the nearer future. Has to be done, and it was a very good thing to do, and we'll talk a lot about that. It isn't the short or middle road towards getting equality of opportunity. So we had to look at admissions policies of one sort or another. First of all, we had to decide, what is it we're really looking for? Is it just race that is the criterion, or is it something having to do with the social environment, with the types of schools they went to, with—

29-00:26:46

Rubens:

The socio-economic standing?

29-00:26:48

King:

The whole socio-economical raft of considerations. What was there from that that was race, gender, et cetera, neutral, and could be built into our admissions or eligibility criteria? That's an enormous amount of what we did. Then, given the realities of the situation, we did another thing, which was a lot of computer simulations. From all the applications you have from students for a given year, you know a lot about them, and it's all on the computer. You can say, suppose my admissions requirements were A, B, C, D; what now is the composition of the class we would end up with? Of course, the political aspects of this had huge racial overtones in Sacramento. Again, this was most prominent with the Latino caucus, as it calls itself, which is the members of the legislature with Latino background. They were quite strong and quite adamant on this. Many times, the message that would come through subtly or not at all subtly was, listen, it's very important that you get a lot of Latino students into the university. Don't blame it on Proposition 209 and SP1, SP2. You're smart. Figure out how to do it. In a sense, that's a lot of what we were faced with, was, you're smart, figure out how to do it.

29-00:28:40

Rubens:

When you say "we," in general, you're referring to the university?

29-00:28:43

King:

I'm referring to the university, yes. The way this consideration happened, it was of course the issue of the day for Atkinson himself. It was certainly the issue of the day for me. The largest part of my staff down at the office of the president, leaving aside things like continuing

education of the bar, was the student services, student affairs, contingent that was under Dennis Galligani. All of that staff, Dennis himself, and then monthly meetings with the chancellors, monthly meetings with the academic vice chancellors, monthly meetings of admissions officers, and then dealings with the senate and senate committees. This was the topic. Those are the ways it got worked on.

29-00:29:41

Rubens:

I guess it's Wayne Kennedy who said that you basically initiated a weekly meeting of vice presidents.

29-00:29:51

King:

We did this at one point, and I'm trying to remember when it was. It was Wayne and I that did it.

29-00:29:58

Rubens:

I think Wayne, in his oral history, says it's your idea.

29-00:30:01

King:

That may be. Wayne chaired it when it happened. It was the latter part of our time together there. It was not so much on this issue. It was on the fact that the office of the president really has two roles. One is its system-wide role and the other is to run itself. The weekly meetings with the vice presidents were on running ourselves at OP.

29-00:30:30

Rubens:

All right, so what's the next step after the outreach taskforce?

29-00:30:36

King:

We'll take outreach taskforce separately, right? On the admissions, we have gone through the immediate taskforce, senate-administration, that defined what to do. We've gone through the way in which a delay to fall of '98 got arranged for undergraduate admissions. The next thing that happened is rather interesting. It's off the subject, but it relates. It was that another issue came along, I believe stimulated by the press. How they got onto it, I don't remember, but it was what came to be known as VIP admissions. That, I think, was boiling away around 1997 also. This issue is one of important people in the state trying to influence the admissions process so as to get admissions for their son, daughter, nephew, friend, business associate's friend, et cetera. This came up within the press. It was something that the office of the president had not surveyed at all, had very little knowledge on. Atkinson knew what had happened at San Diego, and I think it was not done significantly, and perhaps not at all, at San Diego. But it had been going on in various ways. The Berkeley campus even had a committee established to consider these different admissions. That committee was established so as to take the pressure and have it less directly on the chancellor. Otherwise, the regent, the legislator, the whomever it is, calls the chancellor, and the chancellor is left with, what do I do?

Berkeley had actually tried to set up a process for them. I think, on the whole, the campuses had been pretty reluctant and quite limited on doing such things, but they had happened.

Connerly then came into this issue, in a way that one would expect, which is that, since there are no preferences by race, gender, et cetera, there should be no preferences by virtue of your standing of importance in the world, or your importance vis-à-vis the university. He made that quite a strong point. As Dick and I dealt with that, we really came to the conclusion, the only right answer is to have none of this. So such a resolution was presented to the regents, that I believe also had a component that if any special admission was done—and an example raised was if a disabled student had a mentor of the same age and the disabled student had been admitted, then maybe the mentor might be, too—but if the university was to do some very small number of these a year—three, four, whatever—they would be reported to the regents. So that was a component of the resolution that went forward. During the rest of our time, there were no such admissions.

29-00:34:14

Rubens:

So that's a policy that's initiated by the president's office.

29-00:34:21

King:

I believe it was a resolution placed by the president on the table for regental adoption. So it was something adopted by the regents, but like most of what comes to the regents, it was formulated by the president.

29-00:34:39

Rubens:

Right. As distinct from what one and two were. Okay, so that's boiling away.

29-00:34:45

King:

The next issue was the arrival of the eligibility study from CPEC. The CPEC eligibility study found 11.1 percent eligible. That was a godsend, because it's much easier to increase eligibility than to decrease eligibility, because when you decrease it, somebody's getting shut out. We had this remaining 1.4 percent to bring the 11.1 percent up to 12.5 percent again. We had been doing various simulations. The person primarily doing these was Saul Geiser, who still does such things. He's associated with our center here, and still runs simulations based on UC admissions data for various analyses. The idea had come up of admitting by high school rather than on a statewide basis. What originates the idea is that the high schools differ greatly around the state. We're going to get to that again. In the outreach taskforce, we're going to do something big with it. But here we just need the fact that the high schools differ greatly around the state. A student could be a very good student, and in the top something percent of their high school class, and still not make eligibility on a statewide basis because

of factors such as whether they had taken the test, how many advanced placement courses were available to them, and the advanced placement course-taking does get into the eligibility calculation as one factor.

29-00:37:09

Rubens:

And if there were sports and Latin classes.

29-00:37:16

King:

Yes. Also, just advanced placement courses which is an official category of courses. Once we get to comprehensive review, Latin class and editing the newspaper come in quite heavily. We had had a proposition in the legislature. I think it was Teresa Hughes who had put forward just simply converting 12.5 percent statewide to 12.5 percent per high school. That was felt to really compromise academic quality of students coming in, and also would be very hard once you got to the private sector, or places like Lowell High School in San Francisco.

29-00:38:10

Rubens:

What are they called? Public excellence schools, or cream of the crop.

29-00:38:15

King:

Yes. The very strong schools. We did simulations with various percent eligible on a per-school basis, and we considered two and four and six and eight. We discovered that there was a drop-off in the quality of students once you got up above 6 percent. We also found that 4 percent, by the estimates we could make at the time, 4 percent per high school would serve to return us to 12.5 percent. So it was the way you could recover that missing 1.4 percent by doing something different from ordinary eligibility. That was presented to the regents. There was lots of discussion on the regents, and it was adopted by the regents. I have to say, also, I missed the key element here, which is that of course in anything like that the senate has the primary role. So what would happen is Dick, on some occasions, would meet with BOARS. On those occasions and some other occasions, I would meet with BOARS. That is the system-wide senate committee on admissions: Board on Admissions and Relations with Schools. The acronym is BOARS. The senate had gone through all of its procedure, including a vote by the assembly, to recommend that change. With all of that in hand, that went to the regents, I believe, in 1998, and we adopted an eligibility which was this much, on a statewide basis, combinations of test scores and grades, and then top 4 percent by school by grade point ranking within the school, provided those students had completed the A through G college-going courses.

The first year we put this in, the president sent a letter out to the students who were thereby eligible in the high schools, and said, look, you can be eligible for UC. All you have to do is complete the A

through G courses and keep your record through your senior year. A very interesting thing happened. It still amazes me. We had thought, of course, that we would get entirely new and different students this way. What did happen is that those students carried through with the rest of becoming eligible on a statewide basis, so well over 90 percent of the 4 percent per high schools that we thought would not become eligible statewide did become eligible statewide. In order to do that, they had to finish off the A through G courses, which they would have to do for admission, and they would have to take the SAT one and two, which they didn't have to do to get admission as a member of the top 4 percent. But they did anyhow. The very interesting outgrowth of all of that is that we met our return from 11.1 percent to 12.5 percent eligible not by bringing in a bunch of students who would not otherwise be eligible, but by interesting and attracting a bunch of students to apply who would not otherwise have applied. At rural high schools, in particular. That was a very interesting result.

29-00:42:14

Rubens:

Is there a structure that's put in place to stimulate that, to articulate—

29-00:42:19

King:

The president's letter appears to be what stimulated it. They would get that after the junior year, if they had the standing in their high school. First of all, it shows you that things can happen that you're not expecting, and secondly, it shows that you can bring some people across that critical hurdle of applying to and wanting to come to the university by something so simple as a letter from the president.

29-00:42:50

Rubens:

It also says to me how critical the data-gathering is.

29-00:42:55

King:

Oh yes. So 4 percent per high school was quite a triumph at the time, because even though we had thought it would bring in a different caliber of students, nobody could argue with the result once we found out that well over 90 percent of these students were becoming eligible by state-wide standards. You're not compromising anything.

29-00:43:25

Rubens:

But what's happening to the percentages vis-à-vis ethnicity?

29-00:43:31

King:

What happened to the percentages by ethnicity is this. Here you have to go back to the definition of eligibility and what admission is on top of it. Eligibility had nothing ethnic in the way of a criterion attached to it. If people just apply in the same old way, the percent eligible applying to the system, and therefore the freshman class of the UC system, shouldn't change much, and it didn't change much until you put fine-tuning on it. There was a psychologically-generated dip in

applications from underrepresented minorities soon after SP1 and SP2, which is simply interpreted as the message having come across that you're not as welcome here as you were. On the whole, the change on the system-wide basis was not great. Another fine-tuning to look at is what is the percent of those minorities in the eighteen to twenty-one-year-old population versus year, and of course it increases from year to year because of the demographic change we're going through. The percent eligible did not rise as much as that demographic change did. It's another way of saying we had a loss due to the psychological impact, but not great on a system-wide basis.

Now, per campus basis, it was enormous. Berkeley and UCLA both suffered very large losses in entering minority students at the undergraduate level. I believe also the first year that SP1 was applied, the law school admissions at Berkeley had no incoming African American students, but one who had deferred admission from the previous year did come. Very striking effect, and well-recognized by the press, and a lot made out of this. What happened, of course, is that, of the eligible students, those who would have been admitted at Berkeley in the past, and now weren't, then turned to another campus. So you could actually run through the campuses and see where there had been the big changes that occurred at Berkeley and UCLA, smaller changes of that sort, no change, and then, at Riverside in particular—and this is not to downgrade Riverside in any way—a large rise in underrepresented minority enrollment. Well, sure, that's understandable after the fact. If the eligible pool doesn't change that much, but who's getting into Berkeley and UCLA does change, and a lot of minorities either have to go outside UC or find another UC campus, a lot will find another UC campus. That's what happened. It was striking.

29-00:47:27

Rubens:

Through all this, you have several other responsibilities in your portfolio. In terms of just following this all the way out, what are you literally doing? You are constantly meeting with—

29-00:47:46

King:

Well, I think that was by far the single greatest user of my time. It would be a topic of gatherings with the senate. The senior officers would have monthly meetings of an entire morning with the Academic Council, so a subject there. The chair and the vice chair of the Academic Council have offices right there on the same floor where the president and the provost and their offices are, so a lot of meetings with the chair and the vice chair of the Academic Council. Many meetings with Dennis Galligani and his people. A big subject of council vice chancellors, et cetera, and individual conversations with campuses. Your time can get filled very easily this way.



29-00:48:37

Rubens:

You, personally, are not responding to the press? That's not—

29-00:48:42

King:

No. Most of the talking to the press would be done by the public affairs people on this.

29-00:48:48

Rubens:

Similarly, meeting with legislators, that's—

29-00:48:51

King:

Well, I did meet with legislators some. Once we get to the outreach side of this, I did end up at a very major budget hearing in Sacramento, where Lieutenant Governor Bustamante spent quite a bit of time grilling us on what we were doing. Yeah, I did some of that, but the day-to-day dealings with the press would be the public affairs people. The other way the news stories would come is that—remember, the regents meetings were almost every month in those days, so the press was well-represented at regents meetings, and there would be a lot of interviews and little press conferences outside the regents meeting. Once or twice, I would go in with Dick during the press conference he would have with the press after the regents meeting, but usually that was just him alone.

29-00:49:58

Rubens:

What about you vis-à-vis the information affairs officer? Are you feeding—

29-00:50:04

King:

Oh, a lot of interacting with him, yeah. They'll have questions and want to understand. Oh yes.

29-00:50:11

Rubens:

Memos that are being written, or is it mostly face-to-face?

29-00:50:16

King:

Face-to-face, because the issues would be immediate. Some reporter would come in with some question. It might be brand-new, it might not be brand-new, but they'd need it immediately. There was a lot of that. The same thing would happen for a query from a legislator. Things would come from Steve Arditti's office in Sacramento.

29-00:50:36

Rubens:

Yes, the government relations.

29-00:50:41

King:

We'll get, I think later on, to the dynamics of the office of the president. It was an extremely fast-moving place. The issues would change with great rapidity, and you did not have time to go think or

talk to a whole lot of people or do a scholarly study or something. You needed to move on whatever it was pretty darn fast.

29-00:51:03

Rubens: Are you talking almost every day to Atkinson?

29-00:51:08

King: In one way or another, yes, sure. There'd be cabinet meetings, meetings of vice presidents.

29-00:51:14

Rubens: But one-on-one?

29-00:51:15

King: Meetings of me with him, yes. We didn't have those scheduled every day. They might be more like weekly or ten days. Special things would come up, yes. Him dropping down to my office, yes. It's whatever the situation of the day takes.

29-00:51:39

Rubens: I'm not going to ask you right now what your working relationship was.

29-00:51:43

King: Let's do that later. It's a good topic. But let's stick with the admissions. We continued considering the admissions, all of this in great interaction with the senate. Also, the composition of the board of regents changed with the election of Gray Davis, a Democrat, as governor. So more Democrats were coming onto the board, and Republicans were having their terms end. It actually got to the point where the supportiveness of the board for SP1 and SP2—or, for that matter, Proposition 209, which had said much the same thing as SP1 and SP2, which came along a year and a half later—the supportiveness of the board for these things became much less. There were ways in which it would be very helpful to have the regents undo SP1 and SP2. These things arrived at more or less the same time and converged into a regents meeting in, I think, early 2001, January, at which the issues on the table were to repeal, supersede—choose your verb—SP1 and SP2, to alter admissions greatly in a couple of ways. One we haven't mentioned so far, but another component of SP1 was that the percent of students to be admitted on the basis of academic criteria alone, meaning grades and test scores, was actually specified in SP1 to be fifty to seventy-five percent. That was a considerable increase over what had pertained in the past.

Also on the table went the issue of removing that restriction explicitly. Then arriving at the same time was what was called comprehensive review, which is what the Berkeley campus had been doing on admissions for a number of years anyhow. This would now extend it to

the system. There's a list of fourteen allowable criteria that can be considered in admissions. Two of them are grades and test scores. They are the ones with the most consideration. But here are these twelve other factors, all of which comport with Proposition 209 and Regents Resolution SP1, that could also be considered. They have to do with opportunity for education, special talents, extracurricular activities, things of that sort. This, then, would lead to a review process where all of these things were put together into one consideration, and would be judged by readers. There would be multiple readers for admissions applications. There was another change here. All applications would be read by multiple readers, which, because of the giant numbers, had not been the case in the past because there were some that clearly would not qualify, some that clearly did. It was just the middles, the on-the-line ones, that would get the close scrutiny. Now everything would. That had budgetary impact. It takes people to do this.

29-00:55:47

Rubens:

They were hired by the hour? These were people who came on especially for that.

29-00:55:54

King:

Hired by the hour, that is correct. With particular attributes that made them good for being readers. That arrived at the same time, and all of this got put together. That became a regents' item that got lots of discussion. Incidentally, for things like this, the way it works—you asked what the provost does—the regents are all at the table. The president is one of the regents. Somebody has got to present the regents' item and answer the questions. That's the provost for something like this. With every regents meeting, I had to put myself in a condition to be able to do all that. Devise the presentation. What visuals. Have various people look at the visuals, make sure I'm not putting up something that isn't correct. Master the subject matter so as to be able to answer the questions. That, I did a lot of. I was probably the single person who was the most frequent presenter to the regents, running a close race with Wayne Kennedy or [later] Joe Mullinix.

### Audio File 30

30-00:00:02

Rubens:

I wanted you to read into the record the official name of the first taskforce that you—

30-00:00:18

King: Yes, the first taskforce. Its name was Joint Senate-Administration Admissions Taskforce. That's the one that was co-chaired by Arnie Leiman and Dennis Galligani.

30-00:00:30

Rubens: In terms of our narrative and time, you want to trace out the—

30-00:00:34

King: We're still in January 2001, with this great collection of admissions-related issues on the table at the same time. With regard to what language will be used in repealing SP1 and SP2, there had been a lot of negotiation with Ward Connerly and others. Connerly actually seconded the motion to repeal. The argument from his point of view, I believe, essentially being that not only had Proposition 209 negated the need for Resolutions SP1 and SP2, but also we had come a long way down the road and things had been put into place, and there wasn't a need to have something that was other than what Proposition 209 had put into the constitution. However, there were very strong feelings in the legislature, which was Democrat-controlled, and where most members of the Latino caucus are members of the Democratic Party. So there are actually legislators and the lieutenant governor present at that meeting, in a side room, negotiating intensively.

30-00:01:59

Rubens: Negotiating?

30-00:02:00

King: With the president and with Bruce Darling. I was not part of it.

30-00:02:06

Rubens: About the rescinding—

30-00:02:07

King: About the language to be used in the rescinding motion. What would be promised to happen, and when. The clash of sorts was between that "state it now, do it now" strong feeling of those legislative members, and the fact that the senate has a role here, on the other hand. We could not say exactly how we were going to replace our admissions criteria. The senate had not completed its deliberations at that point—our senate. There was actually very strong language proposed by the legislators who were present at the meeting in that side room, which had to be declined by Atkinson and Darling because it would remove the role of the [our] senate. It was with that backdrop that the matter finally came to a wording of the resolution that was offered, and to the votes, which I think was unanimous, to repeal SP1 and SP2.

30-00:03:28

Rubens:

So Atkinson, of course, can be stronger about this. There's a governance issue of overstepping the Academic Senate, because the whole political climate had changed.

30-00:03:41

King:

Yes, the whole political climate is changed. Well, the senate wasn't part of the issue with Governor Wilson—it was changing the timetable of this thing that had been adopted.

30-00:03:58

Rubens:

You had mentioned that the senate had not been, you didn't think, as forthcoming about—

30-00:04:05

King:

Yes, I did indicate that, in the creation of SP1 and SP2, I was surprised that the senate had not taken a stronger stance of ownership of the issue, and the appropriate protocol being that they need to study and deliberate and recommend on the issue before something like this is adopted. That still surprises me.

30-00:04:41

Rubens:

In this particular interaction, Atkinson not wanting to give authority to the legislature, is there also—

30-00:04:49

King:

Well, or take authority away from our senate.

30-00:04:52

Rubens:

Yes. I'm wondering if there's a concomitant bubbling up within the senate. If there's more strength or leadership or commitment to—

30-00:05:01

King:

The senate may not have been aware that that set of negotiations was taking place on that morning. It was very fast-moving. The issue reached its head, I think, late the night before, and then you had something like three hours of discussions and negotiations the next morning. That was it. The senate leadership is not in that room. The senate leadership is sitting out at the regents table.

30-00:05:29

Rubens:

Right, of course. Now, to what extent was this a symbolic move?

30-00:05:37

King:

Well, I think it was symbolic. The existence of SP1 and SP2 had always differentiated the University of California from everything else. It put us out in front in time. That created a lot of difficult issues, one being that the press was focused entirely on the university, not on the broader impact that Proposition 209 had. I think it was symbolic that the issue had been removed. It also, I think, made a greater feeling

of comfort for some of the regents who had been very bothered by this. It also put the senate back where it belonged.

30-00:06:26

Rubens: That's what I was trying to get at before.

30-00:06:32

King: There were a number of healthy things about it.

30-00:06:34

Rubens: Ultimately, it was principle.

30-00:06:36

King: Yes. Connerly, of course, recognized that he would lose a vote if he opposed repealing SP1 and SP2, so what he did was to find a way to climb on the bandwagon while retaining his principles and waving them high. I can go on through other admissions things. Shall we move forward in years? I've got two more of them.

30-00:07:11

Rubens: We talked about the sixteen months that UC is hanging out there. I'm thinking down the road to Connerly taking his movement nationally, and ultimately the Michigan decision. Were other universities—including the Cal State system, but Illinois, Wisconsin—were other people contacting your office?

30-00:07:43

King: We were being watched heavily. Both to see what would happen as a result of this. That would be other universities watching us. It was not yet known that Connerly would go national with this. But of course, once he did go national, then we got a lot of attention. Oh, when that passed, what did you do, and can you tell us the specifics, and all of that. That would happen. The other place that was watching us was the AAUP [American Association of University Presidents].

And, for that matter, the federal government, because, concomitant with this, Bill Clinton is the president. There was a statement by Leon Panetta that this might jeopardize the federal financial support to the University of California. That had to be worked through. I think it didn't get worked through so much as being dropped. It never appeared again from the federal government. The AAUP was concerned that the regents had abrogated proper governance here in taking such a strong role. We actually were investigated by the AAUP, and they came to visit to find out what had happened, et cetera. I don't believe we got a censure from them. It was made an issue. So they were watching us. Yes, we were very, very watched on this, and it continued all through my time there, as the Connerly movement went national and as various other things happened on admissions.

30-00:09:24

Rubens:

Did you deal with Edley at all? Edley was in the Clinton administration.

30-00:09:26

King:

Edley came [to Berkeley as Dean of Boalt Law School] after I left.

30-00:09:29

Rubens:

Yes, I know that, but he was in the Clinton administration, heading up a commission on race.

30-00:09:35

King:

Yes. He was in the administration, that's right. The next one that drew a lot of national attention is more a Dick Atkinson thing than a me thing. It was the fact that Dick Atkinson made a major speech before the American Council of Education in the early 2000s, expressing his concerns about the SAT. He had a variety of concerns. One is that the so-called achievement tests are a better measure of what you have learned and what you can do than the morning test, which is now known simply as the SAT or the SAT one, but back when it had a name, it was the Scholastic Aptitude Test. In a sense, it always was more of an aptitude test than an achievement test. Atkinson's concerns were that the afternoon tests, the SAT II subject matter tests, were a better measure of achievement, and that there were some things about the morning test that were not good. One was that there was no examination of the student's ability to write, because the SAT was all checking boxes, and could therefore be graded by computer. Whereas if somebody writes an essay, that may not be graded by a computer.

30-00:11:10

Rubens:

That was only for the university system, then, there had to be an essay?

30-00:11:16

King:

No, the SATs, per se, had no essay in those days. No writing test. The essay that you think of is part of the UC admissions process. It's part of UC's application form. That's right. That was one concern. The second concern was with the analogies. Dick felt that they assessed a form of reasoning that wasn't an important form of reasoning, and which could also have bias attached to it. So he urged these changes. This became quite a national story. I remember one day when somebody walks into the office holding the current week's copy of Newsweek, and the center spread in Newsweek has a picture of Dick Atkinson on the left and George Bush on the right—or maybe the other way around—with a headline that says, "What do these two men have in common?" Which we all thought was a riotous joke. Dick may not have thought it was so funny. In any event, it turned out that what they had in common was that neither one had taken the SAT. Dick went to the University of Chicago as one of their early admittees. I

think he entered at age fifteen. Chicago did not require the SAT at that time. Bush, for whatever reason, hadn't taken it, too. I guess he did go to Yale. I thought Yale required the SAT, but nonetheless, that was what the two men had in common.

It made a big national stir that Atkinson had proposed this, and it was a big issue for the College Board, who run the SAT, because students who take it in order to try to get admission to the University of California are something like 10 percent of their total test-takers. They're funded by the fees paid by these test-takers. It was an economic issue. The threat was there that UC might withdraw from the use of the SAT. Now, of course, the senate would have had to be part of any such decision, but national media are not so familiar with that fact. The College Board had a brand-new president at that point by the name of Gaston Caperton, who had been a governor of West Virginia before becoming president. He actually visited here, and his vice presidents visited here quite often to talk on this subject. It ended up, interestingly enough, with Pat Hayashi being put on the board for the SAT. Pat Hayashi was Dick Atkinson's associate president, so-called right hand person. Adviser.

30-00:14:43

Rubens:

Like a chief of staff?

30-00:14:47

King:

Dealing with policy issues, though. Not administering his staff. Just his right hand person with regard to anything that had to be done fast. There was a lot of give and take on that, and it ended up with very significant changes to the SAT, and the analogies are gone, and there is now a writing test that is graded by people.

30-00:15:20

Rubens:

Did he consult with you or talk to you about it?

30-00:15:23

King:

He actually did that one very much on his own. He kept that quite guarded before he made the speech, but I was involved in the fallout from it as we dealt with the College Board, and there was a lot of that, as I said. Then also, a natural successor to that was the question of what should be UC's requirements with regard to the SAT. The way that ended up in my day was that, with the change of the SAT one, we kept our requirements as they were. Subsequently, there was more attention given to the afternoon tests. Now, in the latest change, I believe the afternoon tests are not even required anymore. So it's gone back and forth within UC. That was the next one.

The last dealing I had with admissions was, to me, an absolutely bizarre episode. The chair of the regents at the time, John Moores, who



had been founder of several successful computer software companies, was concerned about the fairness of UC admissions and whether, in fact, we still had a thumb or a pinky on the scale with regard to race in some way. So John Moores took, I guess, the engineer's approach to this, which I should understand as an engineer. What he did was ask for the entire Berkley admissions database for undergraduate admissions for a particular year. This is all the applicants, whose privacy has to be protected, so the names were taken out. We did a lot of consideration as to how to protect privacy.

30-00:17:11

Rubens:

Because he was a regent, he could ask for that and get it?

30-00:17:17

King:

A member of the public could do that through public records request, but you don't even have to get to that as the chair of the regents. We could have said, John, you must submit a public records request, but we didn't do that to him. He would have been able to get them through a public records request. He gets the whole admissions database and he does a regression on them. He regresses on the SAT one scores and on the grade point average. Oh my goodness, there's this big unexplained residual left over that is preferential towards racial minorities. So you've done something wrong. Well, Regent Moores, we have fourteen criteria, not just two, and here are the other criteria that the regents adopted through comprehensive review. He picked a couple more of them, ones that could be turned into quantitative measures, and did regressions on grades, test scores, and those couple of things, and still there was a residual, a smaller one. He went on through to leaving aside about three things that just can't be quantified. How do you compare editing the yearbook with being student body president with being a cheerleader? You can't. You can't do it quantitatively, at least. He did all of that, all of this being played out in the press as it went along, because he would release to the press what he was doing and what his conclusions were.

30-00:19:00

Rubens:

What's driving him?

30-00:19:01

King:

Driving him is a suspicion that the university, and particularly the Berkeley campus, as flagship or whatever you want to call it, is in some way getting race into the picture in admissions decisions. The last I knew, we were down to where we had regressed—I guess it was eleven of these things—and there were still three others. There was this tiny residual left, such that I'm sure a statistician would have said that the residual was not statistically important, but of course the press wouldn't say that, and you have to deal with the press. These regressions and conclusions were being given to the press [by

Moore's]. So that's how I spent my last year and a half or two years, was trying to stay a step or two ahead of John Moore's with regard to regressions.

30-00:19:59

Rubens:

How did you do that?

30-00:20:01

King:

Saul Geiser and his people again. We have our statistical people. Yes, they would run them [the regressions], too. That was an absolutely fascinating episode. From a scientist/engineer point of view, I think we did pretty well explain that there wasn't a consideration of race, per se, in these criteria.

30-00:20:25

Rubens:

So it's a year and a half battle?

30-00:20:27

King:

About, yes.

30-00:20:28

Rubens:

Then?

30-00:20:31

King:

This is interesting. The other thing that could have been done is that we could have said, well, since you're asking for something that takes a good bit of work on the part of the office of the president, the rules of the regents are that the relevant committee has to ask for it by vote of the committee. Now, he could have done that. He would, then, have gone the public records route, and we would have still have had to come up with and release the data. Actually, a feeling developed on the regents that he was exercising too much power there as chair, and that the rest of them didn't want this going on, and they thought it was an unnecessary embarrassment to the university. Judith Hopkinson in particular was strong on that way of thinking. This actually led to a motion that censured Moore's. In weak language, but it did that. Of course, my gosh, to pass something like that that censures the chair is a pretty major act. After I left, and I think it was maybe around 2005, Moore's actually resigned as regent before his term was complete. This was after his chairmanship had ended. I think this issue had a lot to do with it.

30-00:22:00

Rubens:

Judith Hopkinson? She was a new regent.

30-00:22:08

King:

She was a Gray Davis regent. One of the first three, maybe, who was appointed by Davis.

30-00:22:13

Rubens:

Wasn't there some issue of what her true leanings were?

30-00:22:22

King:

On the admissions and outreach matters, I don't think so. She's somebody who would never have voted for SP1 and SP2, I believe.

30-00:22:37

Rubens:

She was involved with the rescinding.

30-00:22:41

King:

Yes, she was. She was a very active regent in my time. We used to recognize in the office of the president that some regents were just way more involved and active than others. It relates, for the most part, as to whether they also have some very demanding fulltime job, in which case they just don't have the time to be very active.

30-00:23:13

Rubens:

Or whether they had a principled or ideological state. A constituency.

30-00:23:17

King:

Judith, I think, had resigned as CEO of a firm, either just before or just as she became a regent. She just decided she would spend a lot of time with it. Much of her involvement was on the financial side, and that didn't have to do with me, but a lot that had to do with the financial VPs. Admissions, in summary, was what was the principal consumption of my time during my years as provost. It was certainly a roistering issue, and one that, all along, played heavily in the public eye, because the press would give strong coverage to every regents meeting. I had a lot of conversations with Ward Connerly. Also, the secretary and assistant secretary of the regents, they would draw up the seating arrangements for the dinners that would occur on the middle night of the regents meetings. This would be a dinner of principal OP people and regents. Probably more than anyone else, Jeanne and I were put at the table with Ward Connerly. Jeanne remembers one interesting episode. Ward was very single-minded on this issue of SP1 and SP2 and the things associated with it, and Jeanne found herself seated between Ward on one side and the chair of the San Diego division of the senate on the other side. The San Diego chair was adamantly opposed to Ward, so dinner consisted of this very intense dialogue through Jeanne, all during the dinner.

Ward is a very decent chap, a very intelligent person, a very articulate person. He feels strongly on this issue. I would spend time on the telephone with him, both answering questions, and then, of course, it would be an opportunity to find what might be coming next, because he did put a number of issues related to this on the table. For example, revealing your ethnicity on the application was an issue. It finally got resolved that we would collect the information and then would strip it

before the reviewers read the application. There were lots of things of that ilk. There was also the question of where outreach fell under SP1 and SP2, or Prop 209. That is, can you or can you not racially target outreach? That bounced around. He would introduce a number of things associated with that.

30-00:26:19

Redman:

I'm wondering if all of this work that you were doing in the office of the president, in terms of admissions, led you to rethink diversity within chemical engineering.

30-00:26:38

King:

Oh, sure. Yes, definitely. And chemistry. Remember, I was dean of the college of chemistry. Both of these fields were, by reputation, hard ones for minorities to get into. Then there was, of course, the gender issue in those two fields, too, which we have discussed, I believe in an earlier interview. As all this went on, of course you think deeply about the situation. I personally believe that there are aspects to being a member of a race that really aren't replicable in any other way. It wasn't just a matter of trying to conjure up that collection of criteria that somehow serves as a surrogate for race. The fact that you are black or you are Latino has a meaning in and of itself in our society. A lot of things happen in our society to reduce that consideration, but it's still there. That is clearly important. There were—and this is worthy of discussion with regard to admissions—there were a lot of people who looked at this as UC laboring away to try to find that assembly of surrogates for race that would accomplish the same result as had occurred before SP1 and SP2, but I don't think you can do it. You can try economic status. That certainly doesn't substitute for race. There are an awful lot of poor people of all races. You can look at opportunity of education. That one does the best in substituting, and we'll get to that under outreach. That's a very useful and valuable concept that we got to in outreach, was recognizing the disparities among the schools of the state and who was in the schools of different sorts. That certainly did give a measure of who's where, but still there are aspects to race that are race and race only, I think.

30-00:00:00

Rubens:

You just made this last point about race being critical. Before that, we had been talking about Connerly, about being seated next to him, and sort of how you found him. He certainly did not identify as an African American.

30-00:30:00

King:

He is mixed race. That was another one of his issues, was how to treat mixed race, and the fact that we did not allow mixed race as one of the things you could check on the application form. Well, what we've got on the application form is determined very largely by what the federal

categories are, because we have to match people to them. He would maintain that he's of mixed race. He would readily admit that he's African American, but he would also represent himself as a person rather than an exemplar of a race.

30-00:30:53

Rubens:

Just in his demeanor at regents meetings versus these dinners, how would you describe him? Did he get heated and passionate?

30-00:31:10

King:

If he got heated and passionate, it was only if it was deliberately so. If it would be useful and stressing a point to the audience or to the press or to somebody like that. I think he retained strong reason and rationality at all times. He's a very persuasive talker. Remarkably effective at putting his points across.

30-00:31:38

Rubens:

How about he and Atkinson? Was there ever—

30-00:31:46

King:

I think Dick was comfortable using me as the greater contact with Connerly on specific issues. Certainly when Dick or Bruce Darling, who worked closely with him, were negotiating something like the wording of the actions to repeal SP1 and SP2, Dick would then work more closely and directly with Connerly. We'll talk more about working with Dick in the future, but I think that Dick had his reasons, and probably good reasons, for trying to get some other people close to him to be the prime contacts with people on things, and then leave him in a position where he could take what came back and form judgments and decisions of what to do.

30-00:32:57

Rubens:

I think when we talk about the operations of the office of the president, we'll leave discussion more about the press, because the press sure likes UC as a target.

30-00:33:10

King:

Yes. The targeting of UC, the heavy targeting of UC, that really got to its peak in 2005 and six, which is after my time. But yes, sure, all during my time, we would recognize that the press would write a lot more negative articles about UC than positive articles, and be wanting to make sure that they had the right information and did it well. I will say something there, too, though, which is I think that during my time as provost, the people assigned to the beat of the university tended to be very good people. If I take the San Francisco Chronicle, which is where the difficulties arise in 2005 and 2006, they had a very different person on the university during my years. It was Pam Burdman, who I think was a much more understanding-oriented, dig-in-deeper type of person than some of the Chronicle's subsequent people have been.

Pam really would try to dig and understand an issue, and yes, she would interview me at times as part of that.

30-00:34:49

Rubens: What about the L.A. Times?

30-00:34:51

King: I didn't deal with them as much. If we dig, there is a man reporter from there whom I dealt with quite a bit in the later years, but I'm going to have to recover the name.

30-00:35:09

Rubens: So these are just leftovers. Did you have interaction with Pat Hayashi?

30-00:35:14

King: Sure. Oh yeah.

30-00:35:17

Rubens: Was that—I don't know if the word is troublesome. Was it smooth in terms of the triangle—

30-00:35:23

King: I think generally smooth. You have to realize that, in any organization, there's the CEO. There are the people who have the principal, very time-consuming jobs under the CEO, which translated to vice president of various kinds in my day. Then the president has his own immediate office. That was the distinction vis-à-vis Pat Hayashi. He was Dick's immediate office. He was who Dick turned to when Dick was trying to decide where Dick wanted to be on something, and then deal with the rest of us. I think it's quite okay, and I've seen it in various forms. I remember when I did university council for Yale, which we've discussed, I would be in there talking with the president, Benno Schmidt, and here sitting at his right hand was a professor of English. I wondered what that was about, and finally figured it out. That was his amanuensis with regard to doing his own personal job in administration of the university. Then he had a different relationship with the provost.

30-00:36:48

Rubens: It didn't interfere? Especially on this whole issue of admissions. Did it get in your way? Did it create another hoop?

30-00:37:02

King: No, because I didn't have to convince Pat. I would deal with Dick. There might be some item of information or some immediate issue of the day that Pat and I would talk on, but generally I was dealing with Dick. Pat was just the right arm of Dick.

30-00:37:22

Rubens: I forgot his background. Where did he come from?

30-00:37:34

King:

Pat came from Berkeley. He's a Ph.D. in public policy. He's a graduate of this public policy school. He actually finished the Ph.D. off very late in his career. He had been on the Berkeley campus, and when I arrived in 1987 as provost for professional schools and colleges, Pat was one of two sort of right hand persons to Mike Heyman. The other one was Francisco Hernandez, who later went to Santa Cruz and was vice chancellor for undergraduate affairs there. These were sort of the troubleshooters, special project people.

30-00:38:17

Rubens:

So you knew him?

30-00:38:20

King:

Yes. Oh, I knew Pat quite well.

30-00:38:22

Rubens:

There are people like that that I want to talk about when you do the outreach. There's Troy Duster and Hardy Frye, and there's some others, that were go-to people. I could look this up. Does it matter who was the president of the AAUP? Did you deal with the president?

30-00:38:41

King:

It does not matter. It was a matter of their board deciding that that investigation should be undertaken.

30-00:38:56

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Audio File 31

31-00:03:50

Rubens:

Today we'll discuss further responses in the wake of SP1 and SP2, and ultimately Proposition 209. Just before we get there, I had one little story that I wanted to ask you about. You had talked about the Moores incident last week. Someone told me a story about a high level meeting at the St. Francis Hotel; the meeting had to do with graduate student outreach. Suddenly in the back of the room—and this is one of those meeting rooms with crystal chandeliers—this fellow comes in with a black motorcycle jacket, and maybe leather pants, and holding a helmet, and just strides in. Most of the people there seem unfazed. This man literally sat on top of a table. It was John Moores. Is that possible?

31-00:05:28

King:

That is possible, yes. John Moores is very much his own person, and probably did ride a motorcycle. I'm not remembering explicitly, but this could well be. It wouldn't surprise me at all. He's an interesting man. He did have this particular perseverance on the question of the thumb on the scale in the admissions decisions, but he's done many other things in life. He's also the owner of the San Diego Padres baseball team and is the executive director of the Carter Center, or at least was appointed that something like four years ago, in Atlanta. He must commute there to do that function. He's done many things.

31-00:06:16

Rubens:

Was a Democrat?

31-00:06:18

King:

Yes, and a Gray Davis appointee, nonetheless.

31-00:06:23

Rubens:

Right. We're getting to the topic of outreach. How are you facing this issue? What's going to then be—not the impetus, but the way in which you go about organizing how you're going to do this?

31-00:06:48

King:

Well, I think we should probably talk about it chronologically, which is as good a way as any to organize it. It is one of the things I feel best about, the effort with the outreach taskforce and what came from it. I don't feel good about the fact that the outreach effort, or partnerships, as it's now called, has declined as much as it has in recent years. It was a real roller coaster ride in terms of funding. The way we got into it, of course, is that one of the clauses of regents motion SP1 said there should be a greatly expanded effort in outreach to help prepare students from all backgrounds to become eligible for the University of



California, and that there should be an outreach taskforce. It put some specification on the outreach taskforce to create the approach that would be used for this. Because of its origin in SP1, it started out in a pretty volatile climate in that newspaper stories about it would always recall the fact that it came out of the affirmative action controversy and the regents' motions. How to compose it was the first and most interesting question.

31-00:08:23

Rubens:

Just as we get into that, is my understanding correct that, in the very beginning, there wasn't an appropriation from the legislature for this?

31-00:08:32

King:

Not for the new outreach effort. There was, going into it, by our count, about sixty million dollars that went to outreach in one form or another. The reason we know this is that, the year before I got into the provost position, there had been a study done by a person at the office of the president, inventorying all outreach programs around the system. This led to a compendium of a hundred pages or so, on a hundred programs or so. Every single one of them, grassroots in nature, as is so typical of the university. The creativity lies with the faculty member. The faculty member has an interest in outreach, decides there's something the person can do about it. They go define their own program, and they get their program funded. So we added them up.

31-00:09:24

Redman:

Was this survey of the campuses just of the UC system, or also Cal State?

31-00:09:31

King:

It was the UC system—all campuses of the UC system, and the office of the president. It included all sorts of things. Reading institutes was one example of things that existed then. As another example, the professional development program of the Berkeley Academic Senate, and on and on and on. For ten campuses, you got, as I recall, of order, a hundred programs, adding to about sixty million dollars. About two-thirds of it from the university or the state, one way or another, and about one-third of it, extramural funding.

31-00:10:11

Rubens:

All right, so there's that. No special appropriation for the task at hand.

31-00:10:16

King:

So the idea was that we should define the tasks that were needed, and then there could be appropriations. Of course, it wasn't the legislature who had said that. It was the regents who had said that in setting up the taskforce. So we had to do a good job. The challenges were many. One is that outreach is an extremely complex arena to try to work in and

find out where you can do the most good. That was one complication for sure. The second was that it had all of the emotion leading up to SP1 and SP2 hanging all over it. Third, as a result of that emotion, one of the very first decisions was would it hold public or private meetings, and the answer had to be public meetings. For the first five meetings or so, we had the press sitting right there in the room with us as we deliberated. Then you had to have people on the taskforce who reflected all kinds of different viewpoints and backgrounds, and there were thirty-five of them—a very large number. They ranged from leaders of the California business community to people from within the university, people who were from the Academic Senate, people who were one kind or another of administrator. Warren Fox, the executive director of the California Postsecondary Education Commission, was on it. They had a very helpful and good person from the Los Angeles Unified School District.

31-00:11:50

Rubens: Were there representatives of the legislature?

31-00:11:52

King: The closest we got there was Gary Hart, who had, of course, been in the legislature many years, but had a separate position. He was not yet California secretary for education, which he became for a while. This is in between. Yes, he was on it. It's quite a list, and quite a composition. Some very conservative. Some very much in the other direction, of being extremely bothered that the regents had done away with the ability to target race, per se, ethnicity, per se.

31-00:12:32

Rubens: Who's deciding who is on the taskforce?

31-00:12:34

King: Let's go back to that, because the first question is, who should be the co-chair of the taskforce? I was designated to be the co-chair from UC early on.

31-00:12:51

Rubens: By Atkinson?

31-00:12:52

King: By Atkinson. I think it was both my position as provost, which pertained to these things, and also, I see a line in Pat Pelfrey's book, written with Dick Atkinson, on the outreach effort, saying that I made sense because of my great ability to keep my equanimity under difficult circumstances, and work through difficult things to effective results. Maybe some of that was a reason, too. But who, now, from the business community, from outside the university? It was pretty early on agreed that it should be somebody from the business community, but it started with the regents themselves searching for this person.

They came up with a few candidates, and there was even a case where a name had come through from them. I'm blanking on the name. It was the principal of the Los Angeles office of one of the big five accounting firms. I remember Dennis Galligani and me going down there to meet with him, to tell him about all of this and what it would be. I think we did that on a Tuesday or a Wednesday. The next Saturday came an email from him saying that he'd just been transferred unexpectedly to head the Tokyo office. So he was not the one. That's why I don't remember his name.

Then we went forward from there, and the leadership of the regents became more open to the university administration coming up with people as well. The very first thing had to be the selection of that co-chair. The one that eventually worked, and it was an excellent choice, actually came from the Berkeley campus as a suggestion, and came from the Haas School within the Berkeley campus. It was Richard Clarke, who had, until a recent point, been CEO of Pacific Gas and Electric. He was now no longer CEO. He had been a strong and active member of the advisory board to the Haas School and was felt to be good. He was not of stated position with regard to affirmative action, and was pretty much in middle ground, it turned out. We talked with him. We briefed him. It must have been Dick [Atkinson] who then talked with the leadership of the regents. Along about January of 1996, we converged on him. He was formally appointed by the regents, and by them because of the wording of SP1, which this outreach taskforce had come from. It indicated that the regents would approve the person.

Then Clarke and I, taking input from wherever it came to us, came up with other ideas of people. It was a remarkably good group, but it was also a divided group on this issue. One of the more difficult features was that the regents who are on this group were outnumbered by people of the other viewpoint. You can't get people who deal with affirmative action within the state and within the university, and who have been involved with programs, and not have a strong propensity towards affirmative action. Out of the thirty-five, there may have been something like eight who were basically fully in support of the regents motion.

31-00:16:45

Rubens:

Were you trying to find those people as well?

31-00:16:47

King:

Oh, yes, we had to balance it all over. I'd like to look at the list, which I have in an appendix to the outreach taskforce report, and just comment on a few of them.

31-00:16:58

Rubens:

Because was the goal also to have diversity in terms of gender and race and—

31-00:17:03

King:

Everything. Views and experience in the world. Everything. We had some people from higher education, but outside UC. We had Del Anderson, who was the chancellor of City College of San Francisco. We had Rosemary Papalewis from the California State University. Actually, Gary Hart, the position he had at that time was heading the CSU Institute for Education Reform, so he's CSU, too. That's it from outside UC. We had superintendent of the L.A. Unified School District. We had Bob Collins, who was vice president for instruction of the L.A. Unified School District. We had a number of people from within UC who had various positions. Some like Gene Garcia, who was dean of the Berkeley School of Education. Had a lifetime of dealing with these issues. I would say that also for Manuel Gomez of UC Irvine, who later, incidentally, became vice president for outreach for our system. Sonia Hernandez, deputy superintendent of the California State Department of Education. Several people from industry. The most interesting to me, and very helpful, was Cornell Maier, who had been the chair and CEO of Kaiser Aluminum and Chemical for many years, and had been involved in many civic affairs in the East Bay. In addition to him, Jerry Jacobs, who was an assistant vice president of Pacific Telesis. Jerry Hume, relatively quite conservative. Chairman of the board, Basic American. That name came from the regents as somebody who should be included. Mike Beasley, chief operating officer of Icing Software—you'll ask me what that is—for IBM, who had been chair of the MESA Board for many years.

31-00:19:20

Rubens:

MESA was one of the outreach programs that had—

31-00:19:22

King:

Yes, it was a preexisting outreach program. Caroline Boitano, president and executive director, Bank of America Foundation. And on through many others. Most of the rest, whom I have not mentioned, were from UC, although I should mention Dave Jolly, manager of the Intersegmental Relations Office of the State Department of Education, was another one. I should also mention Bob Saldich, who was president and retired CEO of Raychem Corporation, and who later succeeded Dick Clarke as a co-chair of the outreach advisory board, as it became known after it had done its taskforce work. Clarke did pass away within a year or two after the report came out in 1997, and Saldich stepped in as co-chair and carried through very nicely on that. We had some familiar names like Chang-Lin Tien and Larry Vanderhoef.

31-00:20:27

Rubens:

Larry Vanderhoef was?

31-00:20:28

King:

Chancellor of Davis for many years.

31-00:20:30

Rubens:

Was Karl Pister on this at this point?

31-00:20:32

King:

Karl Pister was not on this, although he later becomes vice president of educational outreach. So here was this group. The trick was to run it in a way that would let the views be heard, let there be honest discussion, yet try to converge. Where is the common ground? What are the things that make sense as concepts to run and deal with? SP1, when you read it, mentions a very short lifetime, something like six months, for this taskforce. It actually was a year and six months that it functioned. It did report to the regents in mid-1997. Amazingly well-received, totally positively. I think that was not just a matter of some care in running it and enabling it to function, but also a matter of our ability to come up with some really good concepts. When you look at the principal recommendations of that education taskforce, the main new one is school partnerships. Partnerships with certain schools. There were criteria put on what those schools should be. As we put forward what turned out to be our modest [proposal for] sixty million dollar incremental budget, twenty-seven million of it was for school partnerships, so just about half. Here, the idea was that UC should work with schools, and given the fact that there's such a huge number of schools in the state, there had to be criteria for use in deciding which schools to work with. This was all based upon a finding that I had not expected before we went into this effort, but which certainly is rational in hindsight. That is that there is an extreme disparity among California's public high schools and school districts. Very unfortunately, the ones that are able to provide the least in the way of educational quality and services are also the ones where the underserved population live. It's also true racially, too.

31-00:23:18

Rubens:

Some of these findings were coming out of the admissions studies?

31-00:23:22

King:

Also the research of people like Jeannie Oakes at UCLA, whose specialty in research had been the disparities among school districts and who was in the districts that were served well or not so well. She had actually made quite a body of research on that. She was not the only researcher in the field, but she was very helpful. We had her speak with the group several times.

31-00:23:49

Rubens:

In light of some of that research, and then the concerns you had about admissions and the 4 percent, et cetera, were you trying to get any representatives of rural school districts?

31-00:24:06

King:

Yes. There's some very interesting statistics here, how they come out of this. It happens that we came across a study that had divided California's public school districts into quintiles, fifths. You could compare the upper quintile and the lower quintile. A hundred and fifty-one schools in both quintiles. These are high schools. Percent urban: 12 percent in the top quintile, 54 percent in the lower. Percent suburban: 69 percent in the top quintile, 19 percent in the lowest one. Percent rural: 19 percent top quintile, 27 percent in bottom quintile. Not as many schools in rural areas, but nonetheless, the disparity is still there, that a substantially greater percentage is in the bottom quintile. Percent involving aid to families with dependent children: 5 percent in the top, 28 percent in the bottom. Percent limited English proficiency: 7 in the top, 31 percent in the bottom. Percent father with high school diploma or higher: 90 percent in the top, 36 percent in the bottom. We go through a lot more things, which were A through F enrollment, scores on the SAT, and then, finally, combined percentage Latino, black, and American Indian: 17 percent in the top schools, 79 percent in the bottom quintile.

That gave us a measure that was race-neutral, that is clearly sensible. Ill-performing schools should be improved. That turned out to be a very convincing argument. So our criteria were that schools be from one of the bottom two quintiles, and that they have demonstrated to us a sincere desire, including good and interested people in the leadership of the schools, to work with UC in a way that could be helpful to these students. That's the main concept we came up with, which was sort of a duality of, it's good to work with schools as the root to the underserved, and you can reach the right people, unfortunately, by looking at the differences among these quintiles of schools. That was our main new recommendation. It was interesting, because I would say the first four or five meetings of this taskforce, there was a lot of tension. There were these very difficult moments where you discovered a large voice for doing this or that in the positive affirmative action direction, and then you would have a regent, or two regents, being the voices of opposition, and maybe a corporate person or two, but no one else.

31-00:27:35

Rubens:

So these were meetings of the whole thirty-five?

31-00:27:38

King:

Yes, they were all meetings of the whole thirty-five.

31-00:27:41

Rubens:

How often did they meet? In the beginning, anyway.

31-00:27:44

King:

Over the course of the year of doing things that led up to when we got into the report stage, I think there must have been something like twenty or twenty-five meetings. It was meeting quite frequently.

31-00:27:59

Rubens:

Where?

31-00:28:01

King:

Various places, but usually somewhere here in the Bay Area. We did go to Southern California for some of them. The press retained its interest heavily through the first four or five meetings, and then petered off as they weren't able to find enough exciting things to write stories about, I guess. It helped to have this press not sitting there, because the discussion then became less a matter of posturing and more a matter of candid and sincere discussion. That helped. Once this concept of the combination of school partnerships and the differentiation among schools by all these various measures, once that appeared, it became cohesive and goal-oriented. Really, the magic moment was discovering that those two things were the horses to ride.

I said there were four areas of recommendation, and out of a sixty million dollar recommended increase, twenty-seven was the school partnerships. The next largest one was student development, I think we called it, which was the MESA, Puente type program and other forms of those. Then the two other areas for substantially lesser funding, but nonetheless recommended strongly, were informational outreach to get the facts out there as to what it takes to attend UC and what it takes financially to attend UC, and the fact that financial aid is very much available. That was the third one. Among those three things, we rated the school partnerships as our long-term strategy, the student development as our mid-term strategy, and the informational outreach as our short-term strategy. Then the other area encouraged was research by skilled university people, such as Jeannie Oakes. In particular, that this would be valuable and should be a use of budget. We combined that research with some other things, so I can't fish it an exact number, but it was eighteen million dollars for the academic development, or student-centered work, and eight million dollars for the informational outreach.

This was presented to the regents. Obviously, those who had been members [of the Task Force] had followed it. I should say which regents were members and where they were on SP1 and SP2. Meredith Khachigian, who had voted for SP1 and SP2. David Lee, who also had voted for SP1 and SP2. He was a Silicon Valley executive and an

engineer, and very active in the Asian American community. Then, finally, Velma Montoya, who had split her vote. She voted against SP1 and for SP2. She was the only regent to have done that. Velma was quite engaged during it, and of course she has an educational background herself, by way of career. In terms of being there all the time and digging into facts and discussing, she did a lot of it. Meredith involved herself heavily, too. David Lee, yes, although there were some meetings he had to miss. I think the fact that these particular regents had been there and had comfort with the report paved the way for this report coming to the regents. The fact that this both made sense as something to try to do and would put the regents back in a positive light, trying to do something to help underserved people get an education, I think that was helpful, too. Without any form of dissent, when this was presented in either May or July of 1997, it was taken up by the regents.

31-00:32:40

Rubens: Are you making the presentation?

31-00:32:42

King: Oh, yes, with Clarke sitting there next to me. We would split the presentations, so both of us. That's what provost means at the office of the president: he who makes presentations to the regents.

31-00:32:58

Rubens: In anticipating the meeting, do you have to run this by Atkinson?

31-00:33:02

King: Oh, yeah. I would talk with him about the content, and then I might do a run-through, depending on how large the issue was. Dick himself might not be there, but people like Bruce Darling and Pat Hayashi would be there. It was very much a collective effort to put these things together and figure out how best to present them.

31-00:33:29

Rubens: In the presentation, was there a request for money to operationalize?

31-00:33:37

King: That's what the sixty million was. We had this budget as part of our report.

31-00:33:46

Rubens: I thought the sixty million was what was already being put into outreach.

31-00:33:51

King: Both are correct. Sixty million was being put into outreach, and our recommended sixty million would double it. With that, then, yes, it was included in the budgetary request by the regents to the state. It ran into state politics in interesting ways. I have to describe that. Jumping



ahead, just to show how serious and difficult the situation was, I think every single year I was there, the outreach budget of the university was one of the things put off to the very end, to the Big Five [the Governor plus Republican and Democratic leaders in both the Senate and the Assembly], which put an element of risk into the jobs of the people who were paid from this outreach budget. Because here it is, a trading card late in the budget game, and will it be continued, will it be doubled, will it be eliminated, will it be halved? They wouldn't know. It was very difficult for the people in those positions, because every July, or whenever the budget would get passed, the question of their jobs was on the line.

In that first year, there was an enormous debate within Sacramento. The governorship was Republican. The legislature was not so solidly Democrat as it is now. Basically, you had a tug-of-war with the Democrats, many of them, wanting the student development programs—more MESA, more Puente, et cetera—and the school partnerships becoming a favorite of the Republicans in the negotiations. In that first year, given the fact that Wilson was still governor, it came down with a budget that was half and half between school partnerships and expansion of the student development programs.

31-00:36:09

Rubens:

So each of the four areas are requesting money.

31-00:36:14

King:

Yes, and since the other two areas have so much less funding, they really weren't part of the negotiation. It was this issue of, do you work with the schools or do you work with the student development programs? A reason that was such an issue, among the reasons, was that the student development programs had been racially targeted. MESA was for minority students. Puente is for Spanish-speaking students. So another problem we faced early on was how to comport MESA and Puente with SP1 and SP2, and then Proposition 209 as it came along. The language distinction remained on Puente, but it was targeted by language rather than by ethnicity. The MESA was a more difficult situation, and it was open to all. It still was very heavily minority with regard to who partook in it, who chose to partake in it, but it was open to all. We had those issues, which obviously had a lot of emotion and strong feelings attached to them, and had to go through that.

A little detour is one of the two areas where the legal readings of regents general counsel became very important and very critical. One of these was the targeting of outreach programs. The other was the targeting of financial aid. On the outreach programs, we came down

with, pretty much, you couldn't target them by race, nearly completely, but some small running room there, such as with the language. Or, just as an aside, when you get to American Indians, the fact that tribes are separate nations gives them a different status. In principle, you could do more with American Indians.

I would like, during this detour, to go back to the financial aid issue, because that one is very crucial. The university, of course, held much targeted financial aid at the time that SP1 came along, and SP2. This would be financial aid that was restricted to an African American student, or a Latino student, or to an Armenian from Fresno, or to whatever, as donors had given scholarships over the years. So did the ones that were targeted have to be untargeted, and what about new financial aid? The way regents general counsel finally came down on that was that any newly accepted financial aid could not be targeted by any of the criteria that are in Prop 209 or SP1, 2. Preexisting financial aid continued to be used as it was used. This then led to the cropping up of a number of external sources of student aid. For instance, a law association in San Francisco came up with student aid for the law school, where they would give the scholarships, and they could racially target them. As, of course, could Stanford and Caltech, and there's another whole subset to this, which is the competition for the very best minority students. They could still be given special things by the leading privates. We couldn't.

31-00:40:34

Redman:

But this wouldn't, theoretically, impact admissions, right?

31-00:40:42

King:

It would impact acceptances of admission--who came. What their choice was when they had more than one college they could go to. That's what it impacted.

31-00:40:55

Rubens:

Could it also be friends of certain departments?

31-00:41:00

King:

Yes. This was done in various forms by groups outside the university that felt strongly about this. The regents general counsel interpretation on that was we could not be part of that effort. Could not spur it, facilitate it, or anything. We could let students receive their aid once those organizations gave aid.

31-00:41:27

Rubens:

That seems like it was a pretty favorable decision on the part of the general counsel, to split it between new and old.

31-00:43:12

King:

Yes. Well, general counsel devoted a lot of effort to this. Both Jim Holst and Gary Morrison. The role of general counsel is, first and foremost, to protect the regents, which would say they should be conservatives. You don't stay at the electric fence. You stay away from the electric fence. They were placed in a difficult situation there, because that, which would say be conservative in what you do here, was tempered with the fact that there were obvious needs for reasons of educational equity, public sentiment, et cetera, to do what we could within the law. In fact, that was another point within the outreach taskforce. There was a line in the report: "In the course of taskforce discussions, considerable attention was given to the questions of student eligibility for outreach services. The university's outreach programs are open to all, but to the extent possible under the law, should emphasize increases in underrepresented racial and ethnic minority participation in postsecondary education." That's a very carefully-crafted line.

31-00:44:45

Rubens:

Was that contested amongst the committee members?

31-00:44:49

King:

It's got something for everyone. It says you've got to stay within the law. That's part of the success in the careful crafting, is that it was pretty much acceptable to all.

31-00:45:03

Rubens:

Who's crafting the language, literally, of the report?

31-00:45:06

King:

Oh, that's Dick Clarke's sentence. The answer on this is that we had a staff, which is listed at the back, which was many people in Dennis Galligani's office, who would do writing. Then draft after draft after draft would come through Dennis and me and Dick Clarke, and we would all scrutinize it heavily. So no, Dick and I didn't sit there and pen the report, but we sure examined, changed, restructured, et cetera, a lot of the report. That was probably my principal activity during those particular years. I want to go on and talk about where the outreach effort got in the way of funding and success.

31-00:46:06

Rubens:

Could I just ask one more question before we take that on? You're picked to do this because of your position, but you mentioned your equanimity.

31-00:46:21

King:

I'm good at that, yes. I remained calm. That tends to make others remain calm.

31-00:46:27

Rubens:

Did it get heated?

31-00:46:28

King:

Oh, it got heated sometimes, particularly in the early meetings. As I said, I think the most difficult situations were when there had been a lot of discussion in the direction of being snug close up against the electric fence rather than away from the electric fence. A regent, who would typically be Meredith, would speak up and say, well, you can't do that. When somebody mentioned that there were offices on campus that could advise minority students academically, she said she thought those were all gone, and so that set a big one off. I remember that one. You just don't want to let this be a pile-up on the regent. That's not going to serve anybody well. That was most difficult. I did most of the running of this, with Dick taking the color commentator role, in John Madden parlance.

31-00:47:41

Rubens:

The color?

31-00:47:44

King:

Football broadcasts. John Madden was the color commentator. He was the other announcer. [The first announcer] calls the game. Through the line, gain three yards, et cetera. Then John Madden comes in with something about the person's history, or an odd thing done by somebody in the backfield of the other team or something like that. Maybe that's an okay analogy. I think it is.

31-00:48:13

Rubens:

It's a nice one. One more little piece. To the point of your equanimity, when this oral history was getting in motion, Russ Ellis happened to be in the office and he mentioned a story.

31-00:48:33

King:

Oh, this is going to be a good one. I don't know what, but if it's Russ, it's going to be good.

31-00:48:36

Rubens:

Well, it had to do with a piece of your history that we haven't quite acknowledged, which had to do with a committee of special opportunities admissions to UC campus. It was prior to SP1 and two, obviously. It couldn't do with race, but it could do with gender and with topics. There was one—he didn't know what it had to do with. Maybe it had to do with a woman artist. He wasn't sure. You were presenting the case, and Mike Teitz, he thinks is the one, went nuts. Just started attacking you, and you just sat there calmly. He attacked, attacked, attacked. I think it was personal.

31-00:49:18

King:

I don't remember this one, but it may well have happened.

31-00:49:20

Rubens:

He said that you said, “Nevertheless, this is the way we’re going to proceed.” It was just calm. You didn’t take the bait. You didn’t respond to it.

31-00:49:31

King:

That is an attribute. I developed that early on. I think it’s not a matter of having concocted something that deflects problems. I don’t think I designed this. I think it’s what I am. A situation becomes ultra-stressful, and somehow I develop even more placidity and thoughtful logic, and just deal with it that way rather than jumping into the emotion. It’s served me very well in my administrative role, including the Hearst Museum when we get to it. [It’s] Probably why I was picked for the Hearst Museum.

31-00:50:18

Rubens:

The logic and the strategy is there, though. As you were saying, it made no sense to pile on the regents. You’re aware of all of the constituencies and the contested issues.

31-00:50:32

King:

Look, not only is it poor form to pile on the regents, this outreach taskforce report has got to go to the regents and be accepted by them.

31-00:50:43

Rubens:

I was using that as an example, though--strategic planning and how to diffuse situations.

31-00:50:55

King:

Okay. Let’s go to how big this became. It really was a jet-assisted takeoff. I have often compared it to taking off in an airplane from John Wayne Airport, if you know what those are like. They just go straight up because of the noise abatement ordinance. I think we did get our sixty million dollars, or something more—something close to it, at least—in that first year, split between the partnerships and the student development, which meant, compared to our budget, some partnership money being steered to student development. Then you have the problem of, okay, you’re going big, fast. How do you gear up and do something on such short timetable? I think we did remarkably well at that. At some point early in the picture, Karl Pister did come in as vice president for educational outreach. He was the one shepherding it. In the first few months, it was me.

31-00:52:07

Rubens:

This is an Atkinson decision, or at your recommendation, that there needs to be someone targeted for that position?

31-00:52:14

King:

We just decided it was such an enormous effort and we had to succeed, and that it couldn't be some of somebody's job. It had to be all of somebody's job.

31-00:52:23

Rubens:

Why Pister?

31-00:52:27

King:

We needed a person who knows that world well, cares passionately about preparing and obtaining success for underrepresented students. It's just all-over Karl, and what he says and what he does. He cares deeply. He was an ex-chancellor as well as an ex-dean of engineering. He was available because he had come off the chancellorship at Santa Cruz. This thing geared up quite rapidly. It geared up all the more in an interesting way when Gray Davis was elected governor, which has to be the year 1998. So he starts in '99.

Gray Davis, first of all, is the one who appointed Gary Hart as secretary of education. Between Davis and Hart, an awful lot came to the university in the way of requests to do special things.

31-00:53:42

Rubens:

Robert Polkinghorn.

31-00:53:53

King:

Yes, we're coming to him. He's part of the staff of the outreach taskforce, by the way, and he was the school partnership person. He oversaw that part of the program, and his background had been that the California Writing Project and things of that sort had been under his wing.

31-00:54:14

Rubens:

My note just said he was close to Hart, too.

31-00:54:17

King:

Oh, and that, too, I think, is correct. The first thing that came was the reading institutes, which Bob had already been doing some of, but Davis wanted an immense expansion of that. These were summer institutes for teachers to get them to be better teachers of reading. Of course, that fit in with the fourth and fifth quintile type of thinking, the need to improve the low-performing schools, because reading is very often the issue there. Reading ability. They came forward with that one. Another one was the principals' institute. A desire that there be special institutes created at Berkeley and UCLA for educating principals to be better principals. Well, that was not part of the outreach taskforce report, and yet it was something the university was being asked to do, and so the university responded and did do it. That was tough to pull off, because you're now in the position of saying,

Berkeley and UCLA, we want you to do this. No, Riverside and Irvine—I've forgotten whether it was Irvine—but no, other campuses, you can't do it, even if you want to. It has to be at Berkeley and UCLA. That's a bad message within the UC system, that Berkeley and UCLA are somehow better.

31-00:56:04

Rubens: Who was making that decision?

31-00:56:07

King: It's what Gray Davis and Gary Hart wanted, was Berkeley and UCLA.

31-00:56:11

Rubens: For the prestige?

31-00:56:15

King: They thought they were best-equipped to do it. You might call that prestige. It's a bit of micromanagement from the governor and secretary, because the better way, and the university's natural way of doing it, would be what campus is interested and what can they bring to bear on it, and make a selection on the basis of those criteria. But no, we were told it must be Berkeley and UCLA. So we had to create interest at Berkeley and UCLA when there was no interest there. So that was a tough road to get those campuses to say, oh yes, we want to do a principal's institute, and build it up and do it. It's just not the way things are normally done in the university. Very top-down as opposed to bottom-up.

## Audio File 32

32-00:00:00

Rubens: You talked about the micromanagement of the governor and the Secretary of Education. Is this because there's now a climate that UC can be messed with? The regents do it, Proposition 209 does it.

32-00:00:30

King: I would plant it more nobly than that. Actually, I think this and one other thing that happened during Gray Davis' time are things that we definitely need to talk about, these were matters of Gray Davis having a lot of respect for the university, which he had gained during his years as a board member of the regents. Lieutenant governor is a board member. He just strongly believed that the university was the most capable body to help him in these ways. Now, does that mean he should have been hands-off rather than coming to the university, and how positive and strong should they have been in coming to us to do this? Well, they didn't say you must do a principals' institute, but when you deal with the governor on the budget and the governor wants a principal's institute, you're pretty likely to respond favorably to a principals' institute. In any event, the other thing, which we have to

talk about, is the governor's institutes on science and innovation, which is another place he very much wanted the university as the university.

There's one other thing that expanded greatly under Gray Davis, and that was the California Subject Matter Projects, which had been Bob Polkinghorn's background. There was the writing project, the math project, and maybe one or two others. That got much greater funds, with the understanding that the programs would grow and grow. When we get to the height of this, in about 2001 or 2002, the numbers are that the UC programs reached 300,000 students. The campuses were partnering with 256 low-performing schools. Seventy thousand teachers were taking part in the California Professional Development Institutes and Subject Matter Projects. That was big.

32-00:02:45

Rubens:

How about principals?

32-00:02:47

King:

I don't have them broken down. They'd be part of the professional development. It would be a small number. I think it was something like fifty principals a summer for each campus. That was really a big, big, big program, and achieving success. Then things happened that affected the future. I think it's a combination of maybe three things. One is Gray Davis got recalled, so he wasn't there. Another is that California developed a horrible budget situation, which just got worse from year to year. The third is that there developed some very strong calls for close scrutiny of accountability of the effectiveness of these programs. Are you preparing more students? I remember this being the principal subject in one of the budget hearings that I was up to Sacramento for, before, I think, a joint senate-assembly committee. Maybe it was just one house. Cruz Bustamante, who was then lieutenant governor, and who was very strong on these issues, both in his lieutenant governor role and his board of regents role as lieutenant governor, kept grilling in on how successful are these programs, and can you prove it, et cetera.

The problem here is these programs actually start in elementary school, or junior high school, and therefore it is six years or so before a student graduates. We were placed in the situation of: we've given you all this money last year. Now you want the same money this year. Show us the success parameters from last year's money. Well, we could talk about these numbers, how many students and where they are, who are in the programs, how many teachers. But what we could not present them with was, this many new enrollments at UC resulted from students who were touched by this program. We couldn't do that for two reasons. One is the lag time of six years or so just hadn't



transpired, so it hadn't been long enough. The second is, we didn't have the data, and it would be very hard to get the data, to find out if this student who applied this year did so because of what went on in our new outreach programs as opposed to something else that had happened in their life. We were not able to give satisfying answers on that. I think there was no way to do so. Bustamante and a couple of others kept beating that drum. For what political reasons, I can't really figure out, because you would think they would want the programs. The result was, with the new governor, and with the ever-tightening budget situation, there was a decline. These programs are now about 10 percent the size that they once were. Ten or fifteen percent. So it was a rapid up, and, unfortunately, rapid down.

32-00:06:35

Rubens:

What about articulation with the community colleges?

32-00:07:02

King:

Yes, that was a very important part of this, was to reach community colleges as well as high schools. I continue to feel that outreach at community colleges is one of the most effective things we can do in terms of payoff. Of course, it would be quicker payoff, too, because you don't have the six-year problem then. The reasons I think that are many-fold. One is that the numbers on the percent of incoming community college students who say they want to do transfer, vis-à-vis the number who actually transfer, are very depressing. There's a very large percent-wise loss of students who had come in saying they want to transfer, as opposed to those who actually end up transferring. Secondly, the community college population is extremely diverse, so it's a diverse pool to try to be working with and bring them to UC. Third, the people who go to community college may be doing so simply because it's possible to live at home and not break up the family life, which is very typical of the Latino population of California. I would think it's more possible to get somebody to go away for the last two years of a bachelor's degree than to go away from home for all four years of the bachelor's degree. I think it's fertile ground. We thought that then, and we most definitely did put that in.

There were some very effective partnerships built, including community colleges. I remember the day when Dick Clarke and I went down at the invitation of the Irvine chancellor and of Juan Lara, who was in charge of the partnership there. We spent the day being driven around by Juan and visiting with people such as the community college president. Actually, there was a vice president of the community college district who was a product of the Harvard School of Education, who was very into this and was making it work. It was a very vivid example of bringing a community college—and it was

actually community college system—into partnership with several high schools and with the Irvine campus to make something that worked. They had gone, over a period of four or five years, from a relatively low transfer rate to a high transfer rate. The sorts of figures that Cruz Bustamante wanted were there for that project, too, and were demonstrable because of the shorter timescale. So yes, there were some very effective community college projects.

We tried a couple of other things with regard to community colleges. There was a year we put into the budget a request for one UC employee advisor per three community colleges. So if there are 109 community colleges, then there are something like thirty-three UC employee advisers. That didn't make it through the budget process. It was a victim of the endgame, so it never happened, but I think that is something that would have been very helpful with regard to encouraging transfer. That was one. The other that we didn't mention under admissions, but was important, was the idea of Dual Admissions—capital “D,” capital “A”—where you would gain admission to both a community college and to a UC campus for transfer, both before you entered the community college. The admission to the UC campus would be contingent upon a certain grade point record and certain courses taken at the community college. This was to provide a clear path. Students would be on it from day one, and would know this and have it to point at as they went through the community college. That was never instituted either. That required funding, and it didn't come.

32-00:12:16

Rubens:

So UCLA, Berkeley, you did get people to do that research to set up—

32-00:12:24

King:

The principal's institute? Yes, and it still exists. I want to address also a little bit about that accountability issue and how we tried to deal with it. We did decide, even though the outreach advisory board, which was an evolution of the outreach taskforce, had stayed in existence, with Bob Saldich co-chairing it with me, through 2002 and actually on until very recently, we decided we needed to do a special appraisal of our outreach programs and examination and dig in deeper, particularly with regard to the what they do produce question. So in 2002, we were in the business of looking for yet another person to co-chair such a thing from the business world. We thought it better to have a different co-chair. Since it was the programs that were being assessed, just having the co-chairs of the outreach advisory board didn't make sense. It had to be a new viewpoint. After some looking and talking, we came across Les Biller. Les was the chief operating officer of Wells Fargo at the time. Les chaired—by himself, no co-chair—an evaluatory panel that looked at our programs.

As I recall, it had interesting members, too. I haven't looked at the list recently, but one I recall is Reed Hastings, a name that is in the news this year. Reed is the founder of Netflix. Reed was a member of it. He was president of the State Board of Education at the time. And so were various other people, drawn from the business community, or other parts of education. This activity did quite a scrutiny, and Biller ended up making a presentation to the regents. It was really our best effort to try to answer the questions of accountability and do they work. I thought it gave good answers. It concluded the programs were doing well, and certainly encouraged their continuation. Nothing negative against Arnold Schwarzenegger, but the fact that Gray Davis, who had been an enormous supporter of these things, was recalled from office, and then the budget situation—there had to be cuts, and you couldn't build anything. That's really what did the outreach in, or brought it down to the much smaller level it's at now.

32-00:15:54

Rubens: The whole office of the president starts going down in general, right? In terms of numbers.

32-00:15:59

King: Yes, but the budget for outreach for the system of state money is down to something like 10 to 15 percent of what it was in the—

32-00:16:07

Rubens: So proportionally, it's going down more dramatically.

32-00:16:10

King: Yes. Much more than the general budget has.

32-00:16:15

Rubens: Is it appropriate now to talk about certain people that are called in to—

32-00:16:20

King: Sure.

32-00:16:22

Rubens: We were talking about Hardy Frye, who I guess directed something called the Urban School Collaborative. He reported to Ellen Switkes and to Pister. You had mentioned, when we were off tape, that he had to explain—what?

32-00:16:40

King: Well, it was important, politically, if you will, that somebody like that, who was such a veteran of the field—

32-00:16:49

Rubens: We should say he was African American. He was a sociologist. Had been a civil rights—

32-00:16:54

King:

And well-connected within UC, and a good thinker. It was very important for us that somebody like that would have a good opinion of what we had come up with in outreach, rather than some sort of negative opinion. I believe he did have a good opinion, and although he wasn't a member of either the taskforce or its staff, was, in many ways, an important believer, supporter, and communicator of what was going on in outreach and what we were trying to build up. He's not the only one of that sort. There would be others.

32-00:17:42

Rubens:

Was Troy Duster one of them?

32-00:17:51

King:

We have to look at the year when Troy went off to New York.

32-00:17:53

Rubens:

Right. But I think he was still doing the—

32-00:17:56

King:

He probably was. Yes. I did not communicate with him directly on this, but we were certainly sensitive to knowing whether he would have a positive view or any concerns about it.

32-00:18:11

Rubens:

Were there other people like that?

32-00:18:13

King:

It would be the veterans who had been concerned with it a very long time. In a sense, the proprietors and initiators of this hundred or so programs that were found in the study at the office of the president the year before the regents resolutions.

32-00:18:32

Rubens:

There was an Hispanic fellow who came in—I think replaced Pister, didn't he?—from the Berkeley campus.

32-00:18:42

King:

Alex Saragoza. Alex was actually the second of our three vice presidents for educational outreach during my time. Karl Pister and Manuel Gomez being the other two. Alex, a very good scholar, a very respected scholar, and a very strong proponent of outreach. He, unfortunately, got caught up in an NCAA investigation, which concluded that grades had been awarded without performance to a couple of football players. That really undercut his effectiveness as vice president, so it was necessary to turn the position over then.

32-00:19:36

Rubens:

But I was wondering, prior to that, was he—

32-00:19:39

King:

Well, he's another one who we would have wanted to have had a very good view of it. There were many such. We would touch base with such people, see what they were saying, et cetera, as to make sure we weren't getting into some kind of conflict situation.

32-00:19:57

Rubens:

I'm just wondering how these names are generated. People know who's active on campuses. As you said, who had run programs previously.

32-00:20:04

King:

They were the preexisting programs. Just as we were able to name Hardy Frye from OP in Santa Cruz before that, we could name Troy Duster and Alex Saragoza from Berkeley, and similar names at other campuses. You'd want Juan Lara at Irvine, and it was UCLA before that, to be positive. Raymund Paredes at UCLA would be another. He held a very high position there in the administration. He, incidentally, is now Texas State commissioner for higher education, so he's risen further.

32-00:22:09

Rubens:

You said that the MESA program and the Puente program did continue. Did you want to just—

32-00:22:25

King:

You had asked earlier about various constituents who we had to make sure were involved and were onboard and comfortable with what we were doing, and certainly, given the size and success of both MESA and Puente, it was important to involve their directors. That was Mike Aldaco for MESA and Felix Galaviz for Puente.

32-00:22:53

Rubens:

Okay. Let me now ask you about a few people that I'm wondering if you, personally, in coming up with the outreach programs, trying to launch them, maintain them, if you have comments about their style and working with them. Did you actually meet with the secretary of education?

32-00:23:22

King:

Gary Hart came to six or seven, or maybe ten, of the outreach taskforce meetings. It was in the context of the meeting and occasional sidebar conversations was my interaction with him.

32-00:23:43

Rubens:

He's an interim secretary, and then Delaine Eastin comes in.

32-00:23:50

King:

No, no, Delaine Eastin was the state superintendent, and thereby a regent.

32-00:23:58

Rubens:

Right. What about Delaine Eastin, and what about—

32-00:24:02

King:

She was there on the board of regents. A very, very vocal proponent of affirmative action in all forms, so her involvement in this was— Very often, she and Bill Bagley, another regent, would be giving quite positive remarks or talks during the course of regents discussion, in the direction of SP1 and SP2 being all wrong and affirmative action needed to be targeted, et cetera. She was not particularly a contributor to the outreach taskforce. I'm not sure if she was in office then.

32-00:24:48

Rubens:

She was.

32-00:24:49

King:

Certainly a very strong supporter of it all.

32-00:24:52

Rubens:

In terms of personal interaction?

32-00:24:55

King:

No personal interaction with her. Other than the hours of sitting at the regents table in discussion with them all.

32-00:24:56

Rubens:

Okay. Then there were a couple other people. Willie Brown.

32-00:25:10

King:

Well, to this day, I remember not the content, but the impact, of the speech he gave at that meeting on July 20, 1995. To me, it was one of the most cogent, forceful defenses of affirmative action I have ever heard. I did have a little bit of contact with Willie Brown. It leaves a warm spot. That was a book was done, sort of a biography of him, and published by the UC Press. On the occasion of that book, there was a reception at Blake House, to which Jeanne and I went. It's for Willie, and it's got a lot of other people there, but here's what I remember. Coming in the door to the living room of Blake House, there is Willie. Willie turns to us and starts a conversation. This is not typical of people in that kind of position.

32-00:26:28

Rubens:

He knows who you are?

32-00:26:32

King:

No, he doesn't know when he turns to me who I am. He finds out who I am because this conversation was all about me, how I like the position, what we did. But much more than superficial. It was a very interesting and deep, if you will, conversation. I enjoyed, very much,

talking with him. I'm very pleased that he now writes for the Chronicle and one can read what he writes every Sunday.

32-00:27:00

Rubens: He's got his tentacles into so much. But then, he was such a powerful person in the legislature.

32-00:27:06

King: Obviously so, but I think his manner of dealing with people, maybe it reminded me of myself some. I just found him extremely comfortable to talk with, and, I thought, extremely cogent, as I say, at that regents meeting of July 20, where not everybody was cogent and reasoned.

32-00:27:25

Rubens: So, then, over the course of you developing the outreach presentation and then the programs, he's not necessarily one of the—

32-00:27:34

King: No, he wasn't an actor then. That's interesting. He was not in on it.

32-00:27:43

Rubens: Then there is Villaraigosa, who headed up an educational committee for the legislature.

32-00:27:57

King: Yes, and he was a regent for the short term that he was speaker. Villaraigosa was there, and quite interested in the outreach. I would say in a way that was all turned to the good. It was accomplishment and solution-oriented rather than stick a spur into you-oriented.

32-00:28:47

Rubens: You were talking about the factors that led to the decrease in the support of outreach, and there was the issue of accountability and weariness. Was that when the scandals were happening about compensation and also—

32-00:29:08

King: No. It's before. The compensation issue, this is when it was in the San Francisco Chronicle, that was '05, '06.

32-00:29:18

Rubens: That's when MRC Greenwood and—

32-00:29:21

King: One of the issues was that MRC had gotten a moving allowance, whereas regental policy was that there are none for people moving within the state.

32-00:29:33

Rubens: Maybe the press is looking for something, but—

32-00:29:35

King:

A very difficult policy to work with, by the way, because certainly somebody who moves from Southern California to Northern California, has made a move, has got the same expense as a move from Colorado to California. It always seemed to me to be sort of an arbitrary distinction, to say none for within the state, and yet give it regularly for people outside the state. But be that as it may, no, there was not a linkage between the Chronicle articles and the outreach decline. The outreach decline, what it ran into primarily, was a change from having been big priority for a sitting governor to being not a particular priority of the next governor, coupled with the great pressure on the state budget.

32-00:30:32

Rubens:

All right, so in terms of outreach and affirmative action, what occupies most of your time at OP?

32-00:30:45

King:

On those subjects? I think we've gone through it pretty well. Certainly, in terms of day-to-day things and administrative needs, those were very, very frequent subjects. There is another role I had, and I've forgotten whether I mentioned it. That was to keep tabs with Regent Connerly. I think I did describe that.

32-00:31:07

Rubens:

Keep tabs?

32-00:31:09

King:

Well, to have frequent enough conversations with Connerly so as to be able to answer whatever questions he might have. If he needed an explanation of something, I would do that. Also, I was tasked with getting us advanced warning on what was coming next.

32-00:31:33

Rubens:

How did you do that, literally?

32-00:31:35

King:

I kept an email correspondence with him, interspersed with phone calls here and there, mostly positioned to answer whatever he might be wanting an answer to, and to find out what was currently on his mind. I felt that I had a very good relationship with him.

32-00:31:55

Rubens:

That's just what I was going to ask. You had mentioned at the end of the session last time about Jeanne being placed at a dinner—

32-00:32:04

King:

Sandwiched. The big thing is made at the last regents meeting, the fact that you're going, and a little resolution about you is read, and you make a little speech and all that. Ward did come to me at that time and



say that he had really enjoyed working with me, and that he knew we were of different opinions on things, but nonetheless. I thought that was—

32-00:32:30

Rubens: Big?

32-00:32:30

King: He didn't have to do that.

32-00:32:32

Redman: You also laughed a bit in saying that part of your job was to try to find out, for the office of the president, what might be coming up with these meetings. I'm just personally curious, did that happen a lot?

32-00:32:48

King: Ward would bring forth a number of surprises from time to time, such as the issue of ethnicity being revealed to reviewers of admission forms, such as the mixed race question and what categories would be check marks on admission. He did, early on, initiate the question of whether there could be any targeting whatsoever in outreach.

32-00:33:28

Redman: But in bringing these as surprises, what political advantage were the regents given by doing it that way?

32-00:33:39

King: I'm not sure there was an advantage. It's just the way it happened. I would say for us to know that something was coming would certainly help us.

32-00:33:51

Rubens: Well, he obviously knew who you were. He decided whether he was going to give you the information or not.

32-00:33:57

King: Yes, sometimes I was the road in. That's true.

32-00:34:00

Rubens: How did he personally get along with Atkinson?

32-00:34:04

King: I can't gauge that real well. I don't know. Knowing Ward, I would suspect that he tried to keep that as a cordial and working relationship.

32-00:34:20

Rubens: I think it's important that you're characterizing him. I wouldn't have quite thought that he had that style. I would have thought of him as being more confrontational.

32-00:34:30

King: He's very positive in his statements. If he wants to do something or thinks something, by gum, he says it. In that sense, he's a person of fixed and firm views.

32-00:34:49

Rubens: But there was some strategy, some politic—

32-00:34:53

King: I'm sure there was. I'm not sure I always understood it. It came across as being an issue [on which] he felt very strongly, and so he must have, to have devoted so much of his life to it.

32-00:35:07

Rubens: Of course. I thought we had a nice discussion last time about how you became aware of and committed to how important issues of diversity, affirmative action—

32-00:35:21

King: Well, I certainly did. When you dig into every quarter of it, you do develop an understanding. As I said, there are elements of disadvantage that are nothing but race. I looked back this morning through the outreach taskforce report, and there's actually a very compelling argument in there. I had forgotten that we had come up with this, but I do now remember it. That was the statistics on various measures of accomplishment, divided by both race and income. What it shows is that disadvantages to the underrepresented minorities occur not just because of low income. That had been an issue early on in the outreach taskforce. Can't you just go to low income as a measure rather than race? The answer is that it doesn't measure the same thing. Here you are. Average SAT score by parental income and ethnicity. You can divide it by ethnicity for incomes below twenty thousand, for incomes of twenty to forty, forty to sixty, and above sixty. There's no difference. The average SAT scores for all people go up some as you go up in income level, but always the highest ones are either Asian or White, and the lowest ones are African American. It means even a high-income African American has got something that is a strike against them. Ward used to talk a fair amount about "acting white" as an issue. He wanted African American youngsters—he wanted somehow to overcome their aversion to acting white, and doing well in school might be acting white.

32-00:38:15

Rubens: There was a whole cultural discussion taking place. I think the actor Dick Gregory was part of it.

32-00:38:20

King: Oh, yes. And Bill Cosby.

32-00:38:21

Rubens:

Bill Cosby, right, about culture and appearance and behavior.

32-00:38:34

King:

Which, incidentally, on outreach, meant that you couldn't reach everything by working through the school. Some things are right there at the ethnic community and family level, and aren't reachable through the school.

32-00:38:46

Rubens:

Critical, yes. So there were community programs, weren't there, that outreach touched?

32-00:38:54

King:

Yes, indeed there were. In many ways, MESA and Puente were that, rather than school, although they were organized through schools.

32-00:39:07

Rubens:

The other person I wanted to ask you about was John Vasconcellos.

32-00:39:12

King:

A lot of interaction with him, but not on this issue. John, when we get to the California Council on Science and Technology, was very close to it. Then he has also recently had his project to improve the functionality of the California state government. Once he left the legislature, retired, and moved to Maui, which he has done, he then started this, I guess it's a foundation, that has interest in California government improvement. He and his folks have had some dealings with me on that here at the center. So I have had a relationship with John, but it was more CCST than this issue.

32-00:40:02

Rubens:

Leon Panetta. He was in the Clinton administration. He'll then set up his institute out here.

32-00:40:10

King:

Leon Panetta. I don't think I've had interaction with him.

32-00:40:16

Rubens:

I think he was the assigned person from the Clinton administration who was keeping tabs on—

32-00:40:22

King:

Oh, he did, early on, after SP1 and SP2, release the Clinton administration's statement that the regents resolutions may have jeopardized our federal grants. But I had no dealings with him on that.

32-00:40:40

Rubens:

There was one other regent. I suppose there's so many comments that you would have, but Brophy. I just wondered about—

32-00:40:46

King:

A lot of contact with Roy Brophy, and some others, too, on this issue, so that's worth talking about. We could talk about Brophy, Bagley, and Alice Gonzales. Brophy, as is well-known, was the Republican who broke with the rest of the Republicans on SP1 and SP2. I had a lot of contact with Roy. We got to know one another well. Unfortunately, he's gone now. That was a very positive relationship with a lot of respect. I actually think he was a deep thinker on the affirmative action issue, because he had been thrust into that by what put him, eventually, in the situation of being the Wilson appointee who voted against Wilson on SP1 and SP2. I found Roy, extremely knowledgeable. Of course, he was, at the time, and I think may well still be, the only person who has been on the boards of all three segments of public higher education in California. He was useful in that he knew it all—CSU and the community colleges as well as UC. I found any questions from him, any comments from him, at the regents meeting to be on the money.

32-00:42:22

Rubens:

Would you talk with him privately at all in terms of strategy?

32-00:42:26

King:

I had lunch with him, whatever, yes. I'd say it was a very good friends relationship. Now, I said Alice Gonzales and I said who else?

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32-00:42:39

Redman:

Bagley.

32-00:42:41

King:

Oh, Bagley. Well, Bagley, of course, was, for years, the very public opponent to SP1 and SP2, and the one who abstained from, I think it was SP1, in order to be able to put it back on the table at a regents meeting. He had this very intricate approach. I came to know Bagley quite well. Everything was done in a vein of humor. A patter of funny things is continually what comes out of him. Obviously, there were good reasons why he was as successful a politician as he was. I have much enjoyed a little book that he wrote, by the way, which is put out by the Institute of Government Studies here. It's little vignettes of his views on the California state government, mostly in the vein of, it worked a lot better back when he was in it. Not necessarily because of him. Alice Gonzales was a Republican appointee to the board of regents, an extremely good friend, and played quite a role in both the opposition efforts on SP1 and SP2, and as we would have the outreach issue come before the board. She was a very good friend. We ended up sitting together often at lunch table or at the dinners. I respected her a lot. She'd been a former high California state official. [Director of the

State Employment Development Department.] There are several others I had close interactions with, including ones of very opposite persuasion. Meredith Khachigian, I had a very good relationship with, in part because of the American University of Armenia, which we will get to. Sue Johnson also was a very good friend. She was a solid Republican regent.

32-00:44:53

Rubens:

Okay. I meant to just follow up when you said we needed a business person—

32-00:45:05

King:

When we went to Les Biller?

32-00:45:06

Rubens:

When we went to Biller. I forgot to ask, why was it so clear you needed a business person?

32-00:45:11

King:

Well, anybody from government is going to have a well-known position on affirmative action which hovers over outreach. Anybody from the higher ed system is going to be just too close to it to do it. What's left?

32-00:45:37

Rubens:

All right, I think those were my leftover questions. I want to get back now to your portfolio as vice president. I wasn't quite sure where to start. I'm wondering, as a transition between having followed out this whole drama and development, starting with SP1 and two, if it's worth commenting on Atkinson's style.

32-00:46:07

King:

Yes, it's a different subject, because it applies to everything, not just to this issue.

32-00:46:11

Rubens:

Exactly. Maybe as a little bit of frame to then dipping down to your different—

32-00:46:17

King:

Let's do that, but I think we can provide a better background if we do talk some about the totality of my portfolio, which, incidentally, is the largest and most diverse portfolio I had anywhere. It was a constantly changing environment. You're talking about the National Labs and Wen Ho Lee one hour. The outreach taskforce would be another hour. What the campus targets on enrollment should be for another hour. Then sitting in a meeting of the vice presidents or with the president on all the current issues of the day, another hour. You just go back and forth from one thing to another. There is a huge concurrent juggling of different issues. The things that are in my portfolio there, there are lots

of things that have to do with student services, in addition to admissions and outreach, which were in the Dennis Galligani area. That was the single largest academic office under me, though, incidentally, not the largest office under me. The largest office under me was Continuing Education of the bar, which is a totally separate and independent program for both legal continuing education in the state and for all sorts of updating and legal briefs for reference materials that they supply around the state. That had over 200 people, continuing education of the bar. It was attached to the office of the president then. It is one of the things that got unloaded in the downsizing of the [Office of the] president. It's still in its same quarters, it's still in Oakland, but it reports to UCLA.

32-00:48:12

Rubens:

It's listed as the second program under you. The first is vice—

32-00:48:15

King:

That's probably alphabetical or something like that.

32-00:48:19

Rubens:

Well vice president for educational outreach is the first thing.

32-00:48:24

King:

Oh, okay. That's because that was a vice president.

32-00:48:27

Rubens:

One's a director, one's a vice president. I get it.

32-00:48:32

King:

Beyond this, another very core one, and very important one, was planning and analysis. That was Sandy Smith in my time, for my entire period there. A number of very capable people working under Sandy, all of whom were excellent. Linda Guerra, Carol Copperud, Paul Eykamp, Ami Zusman, who is now visiting scholar at the center, and others. That office had to do with issues such as the enrollment allocations among the campuses. How are we going to promise the state that we're going to meet the master plan and yet abide by the campuses' desires as to enrollment as best we can? If the parts don't add up to the whole, we've got a problem. Many, many things that took the form of policy of one sort or another were with Sandy. Planning for the size of the university was another. That had an interesting history during my day, and subsequently. When I came into office, one of the things from the Massey years as provost was that Sandy's office had been called assistant vice president for planning. There were thoughts that that office had the responsibility of planning for the system, something with which the campuses and the Council of vice chancellors would surely not agree. They think they're responsible for planning. So I did emphasize the analysis function in there, and I did make it quite clear to Sandy and her people that they

were support staff to bodies like the Council of chancellors and the Council of vice chancellors, and the higher officials who would make the decisions. So supporting the planning function. They did that well, and I don't think I could have had a better group of people.

That, unfortunately, to my mind, has been done away with now. That office no longer exists at the office of the president. The office of the president has created a single institutional research office that covers academic things, business things, budget things, agriculture things, health sciences, et cetera, all in one office. I think that's less good, because you need a clearly academic tinge, or more than a tinge, emphasis in an office that's going to do academic planning.

32-00:51:36

Rubens:

Did you add the word "analysis" under you?

32-00:51:37

King:

I did, yes. Then there was the office of academic advancement, which was Ellen Switkes. I think of the prime functions of that office as being the care and feeding of the academic personnel manual, including orchestrating all the process that goes into creating changes, new sections, and reviews. That office also caught all of the more difficult personnel issues that came up. One of the most interesting in my time was the Irvine fertility clinic mess. Taking eggs from women donors and not keeping track of what came from where, and hither thither. That was an enormous thing back around '97 or '98, and actually led to the dismissal of some faculty members from the university, two in absentia and one right there. Another thing that came from being provost was to be the prosecuting attorney before the regents on a faculty dismissal case. I had about three of those in my time, for different reasons. So dealing with all of the complicated personnel things. Jim Litrownik did indeed have a lot of institutional research type of things going on with regard to the composition of the faculty, trends over time, sizes of departments over time, et cetera. He has now just retired, and that function has gone to the main IR office as well. Mark Westlye was there and had the function of graduate programs and issues that had to do with them.

32-00:53:49

Rubens:

He said outreach was a very small proportion for the graduate school, and that the focus really was on undergraduates.

32-00:53:58

King:

That's right, although there is a section on graduate and professional outreach within the report, but he's right. Now let's go on from there.

32-00:54:24

Rubens:

Regarding research.

32-00:54:25

King:

Research, of course. Okay. I had been in that position of vice provost for research for a year, from '94 to '95. That office had to do with research policy for the system, oversight of the thirty-five MRUs, which were subsequently outsourced to the different campuses around 2007-2008, but are back with OP now, with the new Vice President for Research.

32-00:54:54

Rubens:

MRUs, for the record—

32-00:54:55

King:

Multi-campus research units, of which there were about thirty-five. They were administered out of the office of the president, who would then run the process of appointing a lead campus, reviewing directors to be appointed to the positions, making sure that a multi-campus research unit, located on a campus, did indeed do as much with the rest of the campuses as they should do. We did some changing of campuses for multi-campus research units in my day. The one that I remember well is the White Mountain Research Station, which is over on the White Mountains, east of the Sierra—a favorite spot for us traveling out of Mammoth Lakes, because the bristlecone pines are nearby. It had been switched before my time from Berkeley to UCLA. We switched it from UCLA to San Diego. All of this happened with appointments and new directors. I think there was a good [system-wide] university role there. Then the programmatic aspects of the oversight of the National Labs were in that office, and we should leave that to our National Lab conversation.

Academic Initiatives is something that was started by Dick and me, and which was undone subsequently. With the transition taskforce between the Gardner and Peltason administrations, the decision had been made to get another lifelong academic into the office of the president in the capacity as a vice provost for research. I became that. Now, as Dick and I got there together, we decided we wanted yet another academic presence at the vice provost level in the office of the president. We talked about what the composition of that portfolio should be. We settled on academic initiatives, which I think was my term. This looked at the fact that this person surely should be the caretaker of UC Merced, and anything else that was an initiative. Talking about the nature of Dick, when we get to it, he was very much a creature with his own initiatives, and so there would be office of the president initiatives that stemmed from Dick. A very good example, early on, was the digital library, which stayed at the office of the president, but that came under the office of academic initiatives at the time. So we did a search for a first holder of that office, and interviewed finalists, and selected Carol Tomlinson-Keasey,



32-00:58:06

Rubens:

Oh, I see. She later became the chancellor of Merced.

32-00:58:10

King:

Half of her job in academic initiatives was getting Merced started, and so this poised her very well for becoming, as she did, the first chancellor of UC Merced. But getting Merced going, we need to talk about that as a subject in itself, because it's an interesting one. That fell right within that office. Once Carol went to the chancellor position, we did another search and came up with Julius Zelmanowitz, who held that position for the last and long part of my term as provost. I appointed four vice provosts for research I can think of. Carl Poppe, when I had to have one right away. Sandra Weiss, when we wanted an academic to do it for a year, for the following year while a search was being done. She was from UCSF and had been the chair of the Academic Council the year before. Next came Robert Shelton, from the Davis campus, who then went on to be Provost of the University of North Carolina, President of the University of Arizona, and now Executive Director of the Fiesta Bowl. Then there was the search that led to Larry Coleman, who held it for the rest of my time there.

32-00:59:23

Rubens:

There's a lot here under the vice provost for academic initiatives.

32-00:59:27

King:

Oh, you bet. Well, the whole digital library story is worth some conversations.

32-00:59:32

Rubens:

Educational relations. Inter-campus academic program delivery.

32-00:59:38

King:

Yes, we put Todd Greenspan into educational relations, meaning dealings with the other sectors of public higher ed and other higher education associations.

32-00:59:51

Rubens:

The UC Washington Center.

32-00:59:53

King:

That's another initiative. We can talk some about that. The Sacramento Center was also generated within that office.

32-01:00:20

Rubens:

Dean of students. How many people, literally, were under you? It looked to me like there were—

32-01:00:27

King:

I had about half of the office of the president, counting CEB, and then you've got to figure out how to count agriculture. That always

confounds the number count on the office of the president, because all these county extension people in fact report into OP through the vice president for agriculture, so there's a lot of people in ag, but are they or are they not part of the office of the president?

32-01:00:56

Rubens:

I had the figure here. Are we talking 500 people?

32-01:01:00

King:

Yes. I think we're talking 500 now. About a thousand in my day for the entire Office of the President. But 500 under me, roughly. Two hundred are CEB.

32-01:01:16

Rubens:

I'm trying to figure out how many vice presidents. It looks like you're meeting with nine or ten major—

32-01:01:29

King:

Oh, yes, and I would have individual meetings and we would have group meetings. Then we'd have ad-hoc to-the-issue meetings.

32-01:01:34

Rubens:

You must have had a thousand committees that you—

32-01:01:40

King:

It's a very full calendar. By the time I got to that job, I just simply gave up any control of my schedule. It just got filled. You had to count on having a very, very capable person doing your calendar. I had those too. I believe I said earlier that the staff at OP were very, very good, and I surely believe that. I had Barbara Gerber as an executive director for the office. She had been there a long time. She was excellent. I had, as sort of my own administrative assistance, Jenny Hanson, who went there with me from Berkeley. She was my principal administrative assistant, counting Berkeley and OP, for about eight years.

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33-00:00:00

Rubens:

I just wanted to begin, as a way of warming up to our discussion of specific tasks that you took on that were under your portfolio as provost and senior vice president for academic affairs, by way of mentioning a comment by somebody who worked much lower down in the office of the president while you were there. "I loved working there," he said. He found that what he did really mattered. For you, every day you had a lot on your plate. Did you ever dread it, or did you love it?

33-00:01:05

King:

I liked it, on the whole. There's no single answer for every job. There can, of course, be components that are distasteful, but on the whole, I very much enjoyed it, particularly the extreme multi-dimensionality of everything that was going on. Many different kinds of issues colliding together all at the same time, and yet trying to keep it all working right and get to the ends we were trying to get to through all of it. Yes, that's what I enjoyed. That's my thing.

33-00:01:43

Rubens:

You've made clear in previous interviews that revamping admissions, criteria and outreach—considering the whole student—really touched you and you became very committed to it.

33-00:02:01

King:

All through my career, I think a very sustaining thing has been the expanding horizons. I've probably said this before, but I have often felt that about six or seven years is the right time to be in a job, and that as you move to something else and get new things to think about, you get new problems, new challenges, new things to figure out, and opportunities to make accomplishments in new arenas. That's very sustaining. The fact that everything sort of grew as I went through the UC positions was a really important part of it for me.

33-00:02:43

Rubens:

All right, so in terms of just using the word "figuring things out" as a segue, you figured out how the academic governance worked. You drew up a chart that we're going to have in the appendix. Here it is right here. I'm wondering if you want to explicate it. Anyone who is reading this will be able to turn to it. You actually developed it, this written form, in the last two-thirds of the way through your tenure there.

33-00:03:27

King:

Yes. The way I came to it is a sequence of events. First of all, you get into any new situation, any new job, particularly one as complex as this, and you try to figure out how it really works. There can be what is on paper with regard to how it works, but then there's how it really works, which is the way the people relate, what are the opportunities for bringing someone into the picture, trying to steer things to get a particular accomplishment, et cetera. This chart was actually something I drew up after finding myself trying to explain this in briefer words over and over again to various visitor groups that came through from other countries or other universities.

I remember once, people came from the state of New Jersey, which had a proposal from a governor at the time to switch their university organization to the University of California model. So people from New Jersey wanted to find out what was the California model. I had words to give these people, but I never had anything more lasting. I wrote this diagram, trying to do several things in it. One was to show the lines of governance and the fact that they are in parallel. I had to use four colors in order to do that, for different types of ways the governance worked. I was also trying to make another point I've always tried to make, and that is that there's such a thing as the governance of the system and the office of the president. Those are two different things. They are not the same. It's not just a matter of the office of the president running a system. It is a matter of having, in addition, a lot of campus autonomy and a lot of ways in which groups of this and that from around the campuses get together and share views and best practices on common issues. Then, of course, there's the senate in addition to that, as yet another arm of the structure.

It always strikes me as interesting when I come back to this chart after a while to see that I put the faculty at the top. Then I had the arrows coming down from the faculty, so that probably creates yet another message. These arrows were who, in some sense, reports to whom, or composes what group. That's what I was trying to create. I might say that this is strictly the academic governance of the university. There are many other dimensions to governance other than this academic one. There is the obvious line of administration, which is the regents having the ultimate authority, with the provost working closely with the president, reporting to the regents. The chancellors of the individual campuses, are very much CEOs themselves, but also have a reporting structure to the president and the office of the president. Then, within a campus you have the deans, the department chairs, and ultimately the individual faculty.

But in addition to this, we have the senate at every campus, and at the system-wide level, where it's the Academic Council. Things go on

within the campus senates that are both matters of consultation and input to the chancellors of their campuses, but there are also things that go on within the division senates that are input to the Academic Council, the system-wide senate body. In a sense, a division senate has two ways of reaching the top of the university. It can convince the chancellor and the administration that whatever it is should be a campus initiative and go forward through the administrative line. They also have the option of trying to make it an entire Academic Council initiative, whatever it is. Then it would come in at the level of the system and have its discussion at the broader level. If that were going to happen, the president would, of course, consult with the chancellors. That line would be followed, so—

33-00:08:10

Rubens:

Would you mind clarify who constitutes the division senate?

33-00:08:20

King:

All ladder faculty, meaning assistant, associate, and full professors on that campus are de facto members of the senate. Then the senate will elect its officers, and it will have committees. Typically, they work through what would be called committees on nominations elsewhere, but are committees on committees here. The committee on committees then works to get people interested in doing these committee jobs. They also will be involved in the nominations for division chair. The division chair is typically elected on the campus and has a term that is most often one year, but can be two years. I knew one, during my time, to go on longer than that. It depends on what are the bylaws of the particular campus's division. Then the Academic Council is composed of the chairs of each of the ten divisions of the senate, plus, in my time, about six of the chairs of major committees, system-wide. It meets monthly.

33-00:09:43

Rubens:

I'm not clear about the academic planning council.

33-00:09:50

King:

Those are the two purple ones: academic planning council and executive budget committee. They are what existed in my time. I understand one of them still exists, the academic planning council. I think the executive budget committee may no longer exist. The aim there was this. There is this administrative structure, and they're fast-acting issues that have to be dealt with through that administrative structure. The senate, given its size, the committee structure, being both on the campuses and at the system level, is a slower-moving body.

33-00:10:29

Rubens:

And turning over quickly, I would think. That impairs or impacts it.

33-00:10:34

King:

Yes, that's true, too. There can then be serious issues which involve both the administration and the senate, where deliberation on a faster scale just has to be. I've given you an example of that in earlier interviews, which was the joint taskforce we formed immediately after SP1 to look at admissions. There were two standing groups of that sort, too: the academic planning council and the executive budget committee. To talk about the executive budget committee first, that had non-academic governance as well as academic governance represented in it. It would be some chancellors. It would be Larry Hershman, who was the budget vice president at the office of the president. It would be myself, as provost. It would have the pertinent officers of the senate through the Academic Council. Then it would have the other Senior Vice Presidents. This was maybe ten or twelve people in all. What we would do is have discussions with Larry to guide him into the budget process. We're going to discuss that later on, I know. It was necessary for Larry to know a lot about what the general desires were of the university and of the different campuses as he went forward in the budget process. We'll get to that. The academic planning council would take very broad academic issues that affected the entire system. It would have some academic vice chancellors or provosts. It would have the appropriate leaders of the system-wide senate and the provost. That, too, might be about twelve people.

33-00:12:30

Rubens:

They were appointed by the president?

33-00:12:35

King:

The senate determined its own members by having discussed that, negotiated that, with the administration, but it was the Academic Council chair, the vice chair, and the chairs of—I've forgotten whether it was two or three particular appropriate committees of the Academic Council. In that sense, they generated their own membership. They did it ex officio. With regard to who among the provosts of the different campuses to include, that was my matter, typically consulting with the outgoing provost who was being replaced, and perhaps the other provost who was on there, but basically it was my appointment to make.

33-00:13:30

Rubens:

And the chancellors?

33-00:13:32

King:

Not on the academic planning council.

33-00:13:34

Rubens:

But on the executive budget committee?

33-00:13:38

King: Yes, on the executive budget committee. There were probably three or four chancellors.

33-00:13:42

Rubens: They got there through you?

33-00:13:45

King: No, they got there through the president. The president might well consult with me, and/or with Larry Hershman, in picking them.

33-00:14:00

Rubens: Should we say what the president was looking for in terms of—or you—in terms of—

33-00:14:08

King: I think the criteria were the same for both of those bodies. It was to make sure that there was what would be equitable representation among the system, so you don't stick with the same chancellor, and you make sure you have some old and big campuses and some newer and smaller campuses represented, since they may have different interests. It was really, for the most part, equity of distribution. The ability of the person to contribute as a person is really a secondary consideration there, because, by their very nature, anybody in those positions can contribute well. There's not much to choose among people, all of whom can do it very well.

33-00:14:57

Rubens: Finally, certainly in this initial period—let's say '94 to, I guess, almost 2000—there seems to be more—I don't know if the word is equanimity, but allegiance between the chancellors and the office of the president, especially as the office of the president begins to delegate more authority to the chancellors. There wasn't a contentious relationship.

33-00:15:23

King: It's certainly not a non-contentious relationship. There are always tensions. But my impression—and you have to realize that I saw firsthand only during the period when I was provost—but from what I understand from various hearsay sources, before and after, yes, I think it was a relatively good period for working together and it not being contentious. I think what happened in 2005, six, and seven, which we may get to also, did make that relationship less harmonious.

33-00:16:00

Rubens: Meaning the downturn in the economy and the severe budget cuts and the rise in tuition.

33-00:16:04

King:

The issues surrounding compensation, what was in the press, the slimming down of the office of the president.

33-00:16:18

Rubens:

Lastly, what I was getting at, you're going for equitable representation in terms of chancellors, but was there a need to stack the committee? There were policies you wanted to pursue.

33-00:16:35

King:

I don't think that would work well. The reason is that you're using all of these mechanisms to try to get buy-in and adequate consensus [for] a path to go in. To stack the deck in any way is going to mean you have favored a certain group of views and are not including as much another group of views. Not to include that other group of views is a dangerous road. You really need to get everybody heard and to know and feel that they've been heard in order to develop a path of action that has got all the requisite buy-in.

33-00:17:16

Rubens:

I think that's a good elaboration.

33-00:17:19

King:

I've got another color here, which is green. The point to be made there is that a lot of the governance of this system—now as a system, differentiated from the office of the president—is accomplished by groups of this and that sort of person with similar roles among all the campuses getting together, typically every month or every two months, in order to deal with their issues. That is done by the chancellors. It was the first Wednesday of every month in my day. It is done by the council of vice chancellors, which met about monthly, and all the others listed here. I'll give you, as a build-up to another thing I know we'll talk about, just a way in which that governance structure there was important on a particular issue. As I came in as provost, the office of the president was not that far from the time when it had had an associate vice president or assistant vice president for libraries. Thereby, there had been an administrator of libraries within the office of the president. That position had gone away during the VERIPS [Voluntary Early Retirement Incentive Program] of the early 1990s. It left what was called the library council, which was the group of system-wide librarians meeting together as what amounted to the system-wide governance function of the libraries. So a council of many people had much of the role that had been had by a person in the office of the president.

The librarians at that time—this was before the digital library had come on, although it was very close at hand—would consider common issues of interest to them, which were generally the budget for the libraries, and not getting



enough budget for the libraries. You would get periodic communications to the provost level or elsewhere from the library council, asking for more of a budget. I started meeting with them. It was interesting. I sensed that my role was that of an invited guest who wouldn't be there all the time at the beginning. I went into a set of discussions with them, which had the essential nature that you want and need what you can define and put forward in communications, but it isn't going to get anywhere unless you have other aspects of the university governance brought into those needs. So if you simply put forward a budget request and it hasn't become something that the council of vice chancellors also wants to have happen, it isn't going to do very well. You're one mouth compared to all the other mouths coming forward. I actually tried to encourage that group to work more closely with the other types of administrators. Get your campus provost onboard. Get your senate onboard to what you're interested in. In many ways, they did that. I think it worked much better once that had happened.

33-00:21:08

Rubens:

How long did that take?

33-00:21:10

King:

Three years. The appearance of the digital library initiative helped that greatly, because there was something concrete that everybody would love, that would be a benefit to all. So it was easy to get the buy-in of these other parts of the governance. I guess the point from all of this is that you had to have a way of those of similar function getting together. You had to have a way of them plugging into the other types of administrators on their campus that would be concerned, and get the interest of those other administrators. The senate had to have its role, and then on some fast-moving issues, you had to have a way of the senate and the administration having a continual dialogue. That's what the chart is about.

33-00:22:09

Rubens:

Wonderful explication. The office of the treasurer, that was not—

33-00:22:16

King:

Well, it's not part of the academic governance.

33-00:22:17

Rubens:

But was there representation of that on the budget committee?

33-00:22:22

King:

There was not. The distinction is this. The office of the treasurer handles the money in hand, particularly the investment function of those monies in hand, and the budget is asking for money. It's a different thing

33-00:22:45

Rubens:

Okay. That office of the treasurer reports directly to the regents?

33-00:22:49

King:

The office of the treasurer, at that time, had a split reporting relationship. Both the treasurer and the regents general counsel were officers of the regents and officers of the university. So they had the two roles and the two reporting structures.

33-00:23:13

Rubens:

All right, so we have this laid out. I think that the style, personal as well as the rational leadership strategies that Richard Atkinson took, are very important in the context of this.

33-00:23:37

King:

Yes, they are. They're completely important.

33-00:23:43

Rubens:

We've looked a little bit at his style and his vision as we've talked about different things.

33-00:23:48

King:

Let me back off from that in one way first, just to set the stage. Any president, any CEO, is going to have a particular operating style, a particular background, a particular set of experiences, and a particular set of interests that are particular to that person. One interesting part of my career is that I worked directly in a provostial capacity with five different CEOs. That was two at Berkeley, Mike Heyman and Chang-Lin Tien, and then a very short three weeks with Jack Peltason, an entire tenure with Dick Atkinson, and five or six months with Bob Dynes.

33-00:24:40

Rubens:

Ten years with Atkinson?

33-00:24:43

King:

His whole tenure, which was October 1, 1995 until a mid-date in October, not the first, in 2003. All of these people were quite different from one another. Some would be strong leaders with initiatives of their own. Some preferred to work in what I almost call the chairman style, whereby issues and definitions of alternatives would all come up from below, and they, in effect, evaluate them and decide what to do. The second general comment is that part of the definition of the provost's job, given what it is, is that that person has to adapt to and complement the president. The provost is presumably providing some experience and talents that the president doesn't emphasize, and will be carrying out functions that are beyond the functions that the president wants to carry out. The provost has to do an adaptation job. In a provost-type function to five different CEOs, I found myself

having to do that every time the CEO changed. They were very different.

Dick Atkinson, with whom I worked the closest, is a person of about the fastest intellect I have ever known. He is really smart and has a really fast-moving mind. The first challenge is keeping up with that fast-moving mind. The second thing is that Dick was very much a leader and very much had his own very strong interests as to where the university should go. He would have particular initiatives that he would formulate in his mind, and then the challenge was, how do you move these along? First of all, can you move these along? If you can't, how do you let the president know that this really isn't going to go? But then when you do try to move it along, how will it work with all this on the chart to move it along? The other interesting thing about Dick was that he also very much husbanded his own time so as to use it most effectively in his way. If he thought that enough had happened in a meeting, and that he didn't have something that he needed to try to accomplish more in it, he would just simply leave it. So, "I got to go now," would happen often. That's part of the way anybody comes to grips with how you use your own time, is to decide how to do that. I see in myself more of a tendency to sit through meetings longer than I should, but just to try to keep it all harmonious and going well. Well, that's fine. The president and the provost should be complementary to one another. I think we had a pretty good thing going there.

I guess the most distinguishing thing was that Dick was a person of initiatives himself. Early on, he decided he wanted the digital library project to move fast. That created no difficulty for me, because I had had that project in mind before he came up with the idea, and I had been unable to move it. Remember, I had been there as a vice provost for research for a year, and the librarians in the libraries in fact came under the vice provost for research. So just recycling a bit here. The period I talked about, about trying to swing the librarians to work more with the other administrators, that was actually done during my year as vice provost for research. I had tried to move the digital library as part of that then, but I can tell you that a provost trying to move something is nowhere near as effective as a president having it as a prime initiative. So there was a very strong one that he had, and there were a number of others.

An interesting story, also somewhat indicative of the working style, relating to the digital library, is I recall very much the day when I had three different people come into my provost office for urgent appointments. Every single one of them had just been talked to by Dick Atkinson, asking him for a master plan for the libraries. They were Richard Lucier, who was the person we had brought in as university librarian at the system level and head of the digital library

project, Carol Tomlinson-Keasey, who was the vice provost for academic initiatives, a position we created, and Elliot Brownlee, who was there as a special advisor to the provost and president, coming from his years as chair of the Academic Council. There's an example of a case where Dick just tried to move it by sparking people to think about it, without using the channels of organization. I think he would do that for two reasons. I think, first of all, he thought it was very good, and it did work well to have multiple people thinking about it. It was when they would run into one another and find they each had the same assignment, were treading on one another's toes, that there might be difficulties. But to get multiple people engaging an issue and thinking about what to do with it was a way of operating of his. Also, if he had something on his mind, he would turn to who was at hand with what he had on his mind. That way, you might pick up a seemingly odd topic or assignment.

So he was very fast-moving; very urgent in trying to get things done; very specific with some of these initiatives. I remember also an airplane trip to somewhere, and coming back on the plane, Dick and me sitting in adjacent seats. He is, at that point, trying to move the idea that eventually became the master of advanced study, which is a high fee-bearing master's degree that is done with the university extension helping run it, and has to, nonetheless, because it's a master's degree, have the full approval of the Academic Senate mechanism. He had a name for this that he wanted. It was, indeed, master of advanced study. Isn't that interesting that that name went all the way through the process and survived? Had me write it down at the time so that I would know that was the name I should be proceeding with. There were other initiatives. That was one.

33-00:33:11

Rubens:

Was the Internet2, the national consortium, related to the digital library?

33-00:33:18

King:

It follows the digital library. The digital library is getting all of this stuff that we have here on shelves and electronic content for people to read on their computer stream. Internet2 was an internet system that would give extremely rapid broadband communication to move that stuff around. Internet2 is a national initiative. Digital library was a UC initiative.

33-00:33:43

Rubens:

Did UC take leadership in that?

33-00:33:48

King:

There were UC people with leadership roles in that, but only as members of advisory councils. Although there is something called

CENIC, which is a California version of a fast internet linkup that actually has been headed for many years by Jim Dolgonas, who had been an administrator at OP and left UC in order to do that job with CENIC.

33-00:34:18

Rubens:

What about UC Digital Archive?

33-00:34:28

King:

That one was started before my time here at the center. It started as a Center for Studies in Higher Education project by John Douglass, who put a lot of material from OP and the regents and elsewhere online. Then maybe six months or a year after I got here to the center, John concluded, and I think rightly, that this was not something we should shepherd as an ongoing project, and so it was transferred to the Bancroft Library.

33-00:35:05

Rubens:

Sorry, that derailed you a little bit. Just to return to Atkinson, did he tell you in the beginning or as the years progressed, I'm not going to deal with this, I would like you to take this on?

33-00:35:28

King:

That would happen, yes. He was very much in control of his own time and what he should be dealing with.

33-00:35:39

Rubens:

Did he bring in a lot of people? I was under the impression that he didn't. He brought in, of course, someone who had worked with him before as a—

33-00:35:48

King:

There are people who were hired into positions that already existed, but there were also some new positions. I believe the office of the president did grow in numbers during our years. There were some very important hires that he made. One early on was Bruce Darling into what became the university relations post—so all the external things. Dick also relied heavily on Bruce, as the years went on, for staying in contact with the regents. In something like that episode that we were into in one of the last sessions, where the legislative leadership was sitting right there next to the regents meeting room on that morning when the wording with regard to the repealing of SP1 and SP2 happened, Bruce would do an enormous amount of communication with individual regents and/or individual legislators in front of that. Dick used Bruce quite heavily that way. Now, other new positions. Certainly the vice provost for academic initiatives was a new position, and that, I think we have talked about. It was a matter of, A, our belief that there should be another senior academic down there, and B, the fact that the thing that was obviously unique about the Atkinson

administration was initiatives, and therefore vice provost for academic initiatives.

33-00:37:33

Rubens:

Was there a feeling he was a stacking up people that he had worked with before and were his people.

33-00:37:48

King:

I think Bruce is the one, and Bruce had actually been with Dick all the way, because Bruce was originally hired by Dick when Dick was either deputy director or director, as he ultimately became, of the National Science Foundation. Bruce had been with him there, went with Dick when Dick went to San Diego, went with Dick when Dick came here. I don't know that that's a padding of OP with San Diego people. I would think that that's more a matter of having close associates with whom you have worked for a long time and feel very comfortable.

33-00:38:33

Rubens:

Then there was one other attribute of Atkinson that comes up often. What people comment on is a style that seemed as if he shot from the hip. That he was—

33-00:38:50

King:

Well, that's an interesting observation. I can see why people might think that. Let me try to word what I think the issue is in a different way. Often, these initiatives would come up with minimal amplification from Dick. Gee, we should do X, Y, Z. Why does he want to do X, Y, Z? Then he's gone, and doesn't give you any more insight as to why it's X, Y, Z. Then you deal with this for two or three days, and you see why it's X, Y, Z. His manner of putting forward something could suggest shooting from the hip, but my experience was that there was an awful lot of mental framework this idea was coming from. The other thing I would say about Dick is that, of many, many people with whom I've worked, who have this character of firing out ideas, I can think of only one other who had as high a fraction of them be very good ideas that had life and worked well in practice. That one other is out of the world of chemical engineering, not out of the world of university administration. It was Alan Michaels.

33-00:40:27

Rubens:

Shooting from the hip is not my characterization. It was a phrase, for instance, in the book *Burning Down the House*. It sounds to me as if someone who doesn't know all of the history of the Atkinson administration and the way in which his mind worked, so they're looking at perhaps ways in which he speaks at a particular meeting, and that it seems as if he's switched position, or now he has something new to say.

33-00:40:54

King:

He certainly has a political sensitivity. If he sees that he needs to change a position in order to accomplish whatever it is through the necessary politics, then he will adjust his position. To me, the distinguishing feature was, here is a president who is an initiator, a thinker. More so than any of the others I worked with, clearly. So it was not a matter of moderating the place, or convening people to make it all work right. It was a matter of having ideas of his own that were very good ideas, and then, for me, the trick was how to work in this extremely consultative, multifaceted, highly interacting system of consultation to move the idea along, when in fact, within this university, most ideas come from the faculty and the bottom. Here's ideas coming from the top. There are at least two other things that have that character. One is the 4 percent plan was very much pushed from Dick. Another was that comprehensive review was very much pushed from Dick. Almost invariably, when he or we met with the senate to try to get them going on what had to be their major role in this, they would respond positively. That's not an ordinary thing for the senate to be responsive to an idea that comes from the administration. I think that's just another commentary on the high quality that these ideas and initiatives tended to have.

33-00:43:03

Rubens:

Do you think that there are other initiatives that we should focus on?

33-00:43:11

King:

The digital library will certainly be one, and the Merced campus will certainly be another, and industry-university cooperative research will very much be one. We've got them coming.

I want to say a few more things about the digital library. Its time was right and its place was right. The time was right in the sense of the ever-growing pressures on library budgets, and the digital library being a way to acquire holdings for a multiplicity of campuses, rather than each campus dealing itself with publishers, buying print copies of things, coupled with our building northern and southern regional library facilities at great rate to store these books. I think we've now built our last addition to the regional library facilities, because it's all coming electronic now. The timing was right on that, and it was particularly right for UC because of the one university and ten campus aspect of it. It was something which, at the time, there was some grumbling, but everybody eventually agreed that the right place to put it was at the office of the president rather than on some campus. It remains at the office of the president. Even with the office of the president now having taken the position that they're unloading all academic programs to the campuses, the digital library is still there. This would be a matter, then, of the person in charge of the digital library to work with the individual campus librarians to decide what to

get, in what quantity of subscriptions, for the different campuses. The world was moving much more to what is called, in the industry, the big deal, which is where a major publisher, such as Elsevier or Springer Verlag, publishes a huge array of journals that compose a large fraction of what's in a library. They have created a very complex pricing structure, which we can talk about, but which makes for a very big and very crucial negotiation with them, with regard to new contracts for licensing their material or renewing old ones.

We did have, during my time, an extremely public negotiation with Elsevier on renewal of their big deal. It's probably worth some commentary, even though it's not the beginning of the digital library. The tradition from these publishers had been that part of the deal they would make with you would be an agreement not to reveal how much you paid for the content. So no university knew what other universities were paying for the content. Here was UC, in the early 2000s, with a budget problem coming on, and a renewal of five years, and taking a stance that we must have a reduction of 15 or 20 percent in the cost of getting all this material from Elsevier. They also price it so that you don't gain anything by taking a few journals out of the package. The incentive is to get you to take the whole package, which will bring in the most dollars [to them]. All of that is understandable when you realize that the incremental cost of digital content is zero. Really, they don't have to do anything to give it to one more subscriber. Because there was some consultation with the senate on this, this issue got to the campuses. It got to the campus senates. The Santa Cruz division passed a resolution to boycott Elsevier for publishing articles. A couple of very senior professors at the San Francisco campus became very activist on this subject, and very public within their professional societies. Meanwhile, this negotiation was going on. Then, the most interesting thing that happened is that the Elsevier stock started to drop in price. The fact that this was public was now having a stock price effect on Elsevier, and everybody could see it. It settled all pretty quick after that. It is an interesting world, those big deals, so-called. It is called the big deal in the literature when you read about it.

Anyhow, that was later on in the digital library game, but as we started it, we had to acquire, now, a university librarian at OP who was the digital librarian. That's what had gone away not too many years before, with the VERIPs of the early nineties, was a university librarian. We had the campuses participate with us in the recruitment. We did get Richard Lucier, who had been the university librarian of the San Francisco campus, who was known to everybody and very respected. That helped get it started. Then when Lucier left, the replacement was Dan Greenstein, who's still there now, but in a different job function. He's more planning and analysis for the provost and the president, and the administration of the digital library and of



the library system is being done by others. That was an initiative that had a lot of Dick Atkinson's leadership in it, and which moved very well indeed. Then you want to move onto Washington and Sacramento, right?

33-00:49:31

Rubens:

I think so.

33-00:49:33

King:

Washington comes first. The Washington operation was actually there, and had been there for a number of years before Dick and I came into office. What it is, is a way for a certain number of students from each participating campus to go to Washington, D.C. There will be some faculty-in-residence from whom they can take courses, and they will also do an internship, which is arranged and moderated in a Practice School fashion if you look back early in my career, with various offices in the Congress or in the Executive Branch, or even the national organizations that are in Washington. When it started, it was in rented space, and each campus had its own program. There wasn't a system-wide program. That was inefficient. I remember actually visiting that rented space once early on, and there might as well have been lines of yellow or blue tape down the floor as to which campus was in what office and what part of what office. That, too, was inefficient. Here was something academic in nature that really called for a system-wide role. With Carol Tomlinson-Keasey first as vice provost for academic initiatives, and then with Julius Zelmanowitz when he succeeded her, we moved in the direction of making this truly a system-wide operation. Where we stand now is to have a system-wide director who is resident. That's Bruce Cain from the Berkeley campus, who has also been head of IGS here, and who's quoted forever in the newspaper.

33-00:51:32

Rubens:

Polsby before, I think, yes?

33-00:51:33

King:

Polsby preceded him as head of IGS, yeah, and Jack Citrin now, with Bruce being off in Washington. We moved to make this [the Washington program] a system-wide operation. Now, that meant taking local interests from different campuses and somehow bringing them together into this group. So it was not an easy thing to do. There is an immense amount of negotiation at the beginning as to what role and how much power, if you will, the system-wide director in Washington would have vis-à-vis the campus directors of their program. Now that's pretty much all gone away, and the system-wide director is the system-wide director. It was not easy to get there. It's difficult to take something that is programmatic and is well-ensconced in the leadership and the workings of the different campuses and make

something system-wide out of it. That is an example where we did that.

33-00:52:47

Rubens: Was there some impulse to do that for the education abroad program?

33-00:52:51

King: Yes, at a still earlier point in time. By the time I got there, I had education abroad coming into me. The resolution on it had been that it would be in Santa Barbara, in terms of where all the people were but would report to the provost at the office of the president. That was another large enterprise that was truly system-wide at that point. It had a system-wide director, who in my day was John Marcum, former academic vice chancellor of the Santa Cruz campus, and a very distinguished scholar. I would see him about every second Monday. He would come up and we would meet.

33-00:53:34

Rubens: That often?

33-00:53:36

King: Yeah. We worked together a lot. There were things that were quite involved with the program. The education abroad program was large and complex. Forty-four countries. About fifteen or twenty directors in various places around the world. It was a big operation. So there was Washington. Then, later on in my time, and particularly through Julius Zelmanowitz, we came the idea of, well, if we could do this in Washington, why don't we do it in Sacramento, because there's governance there, too, to be studied and have interns and look at. So there was an initiative to start up a Sacramento center. That was discussed a number of times with the provosts and vice chancellors and with other bodies. There was enough support and enthusiasm, including, eventually, from the council of chancellors, so that we did move ahead with it. That was a much smaller program than the Washington program. It, as was the case for Washington, got put in the same building as the university's government relations office. With that, I should cycle back to a huge initiative associated with the Washington program, which is that we built a building, right there on Rhode Island Avenue, near Scott Circle.

That [the building] is something like eight or more stories high. The first floor is the federal government relations office, which is the equivalent of the Sacramento office in Washington, but the rest of it is this program, including lodging facilities for the students while they're in Washington.

33-00:55:55

Rubens:

Yeah. The budget for both the building and the operation of this program—

33-00:56:04

King:

The student fees for those students go to the program, and that helps pay for the students. The student living accommodations are purchased, just like students would buy living accommodations here in California. The government relations office had its own budget. It came under Bruce Darling, but with its own budget. The Washington center had budget—the administration of the Washington center. So what is now Bruce Cain and his staff would have budget. That doesn't answer how the building was paid for. I don't remember well how that was done. I think it may be a bond issue that's been recovered from rents.

33-00:56:53

Rubens:

As an example, let's say with the Washington program and the Sacramento program, there's a budget that you're overseeing to some extent. You have directors, but there's something that has to cross your desk and you take a look at.

33-00:57:10

King:

There was a substantial amount of administration and the budget that went with it for these functions that came under the provost and OP.

#### Audio File 34

34-00:00:03

Rubens:

We were talking about how much came through your desk. I did want to just get in a question about your use of email. You must have started prior to going—

34-00:00:29

King:

Once it was available, I became a heavy user of it. Yes, that was while I was still provost for professional schools and colleges here. We had email systems within the office of the president. I recall it not by year. I recall it by what I was doing, and I was surely in the provost position here on Berkeley campus as it arrived. I quite rapidly found it an excellent way of doing things. What it does is to relieve everything associated with playing phone tag. It doesn't matter if the person is traveling in New York or China. You can still have a twenty-four hour turnaround with them on email. It's a remarkably effective way of exchanging information and thoughts, and saying yes and saying no, quite rapidly. So I have used it very heavily. I know I have a reputation for answering it much faster and in more detail than anybody would ever expect me to. My successor at OP, MRC Greenwood, one of the first things she came back to me with was, "Jud, you've put me in a

horrible situation. Everybody expects the email to be answered immediately.” I’m a heavy user of it.

34-00:02:01

Rubens:

It wasn’t being screened by your chief administrator?

34-00:02:07

King:

No, I never did that. What I’ll do is, when in doubt, copy a person on an email. My chief administrator might well see what the emails were that I was sending back and forth to people, because she—we should talk some about them, too.

They would be dealing with the issue, too. To have them not know what I had done, and me not know what they had done, would make no sense. When it’s done by email, that’s all taken care of right away, if you do all the CCs. Nobody is in the dark.

34-00:02:48

Rubens:

Right. Including Atkinson? Were you emailing with him?

34-00:02:51

King:

He was less of a user of email. In his case, it did go through Diana, who was his number one administrator. However, here was the change when Bob Dynes arrived. As of the arrival of Bob Dynes, I had to get a BlackBerry, because Bob Dynes did everything by BlackBerry, and I would go back and forth with him.

34-00:03:19

Rubens:

I was going to ask you if you were using a portable computer. If you took it with you on all these trips.

34-00:03:25

King:

Oh, yes. For that reason.

34-00:03:30

Rubens:

I was going to ask you about Barbara Gerber.

34-00:03:32

King:

Yeah. We should talk a little bit about Norma Esherick, too. Barbara Gerber had, I believe it was called executive director role, for the office of the provost, and therefore was very much my chief of staff. We had a wonderful working relationship. I really enjoyed and admired her.

34-00:03:55

Rubens:

She had been there before.

34-00:03:56

King:

Yes, she had. The history of that position is kind of interesting. She had been there with Walter Massey. I don’t know how much before

Walter, but I do know that one of her predecessors had been Lynne Withey, who eventually became head of the UC Press.

[Break in interview]

34-00:04:21

Rubens: We were talking about Barbara Gerber. I can't remember how much we—

34-00:04:27

King: Just the fact that her role was extremely important, and very well and competently done by her. That fits right in with the generalization I made about the capabilities of the staff people at OP being excellent, and they certainly were excellent with her. She was with me all the way. Excuse me— there was something like three months at the end when she wasn't there after she had retired, but she was there nearly all of the time. She was very effective, and we had a very good working relationship. I think there was a lot of respect back and forth. She's now the business manager of her husband's solar energy company, living in Occidental.

34-00:05:52

Rubens: There was another person you wanted to mention.

34-00:05:53

King: Norma Esherick, I thought, was worthy of mention, for sure. She had a similar role, although it was called analyst, with me during my time as provost for professional schools and colleges at Berkeley. She is a very interesting person. She was the wife of Joseph Esherick, the architect, and had worked for years in the college of environmental design, which is probably where she and Joe met. She was a very, very good analyst, and very capable at putting information to me immediately when I wanted it—either deriving it herself, or finding it, or getting it from somebody else on campus.

34-00:06:40

Rubens: You brought her?

34-00:06:41

King: She was there in the office when I got there. She came with the office. She also was excellent. Then I had a number of administrative assistant types, several of whom were very good. I think I've mentioned them before.

34-00:06:59

Rubens: I think so. Is it time to move to the Merced campus?

34-00:07:07

King: Yes. The biggest initiative.

34-00:07:14

Rubens:

How far along was that by the time you—

34-00:07:18

King:

The regents meeting at which I was appointed vice provost for research was the meeting at which the selection was made of the site for the tenth campus. There had been a selection committee composed of regents and senior administrators. It had actually split on its recommendation.

34-00:07:45

Redman:

By site, do you mean had the choice of Merced been made, or an actual plot of land?

34-00:07:52

King:

No. The way that process transpired is that, first, a process was carried out where it was decided whether the new campus should be in the northern part of the state, the central part of the state, or the southern part of the state. That one came out central. Then there were, I think, nine candidate sites. There were probably more sites than that initially, but an early screening process boiled it down to nine. Then detailed studies were done of the nine. I guess there were three left by the time the selection committee made this vote. There were two in the Fresno area and one in the Merced area. The Merced area got picked. My impression, and others will know more about this than I, but my impression is that what led to the selection of Merced was a very well-organized campaign on the part of people from the community, led by capable people from within the community, the fact that the land was there, clearly available and cost nothing, and the fact that the water was there and clearly available. It was the Virginia Smith Trust. It was those issues together that swung them for Merced.

The selection had been made, and nobody had done anything further yet. Dick Atkinson became president in October of '95. The immediate question placed on the table and pushed from Merced was, how soon will this begin? Now, how soon will it begin and should it begin was an extremely critical and difficult question. When you start such a project, you do not want to live with a hole in the ground. You need confidence that you are going to be able to proceed and finish it. Yet, everybody going into it knew that it would be a long and torturous procedure, and so it was. One of the reasons was all of the requirements of permitting and the handles, as I sometimes call them, in the law for people to make lawsuits against the campus. There were people who wanted the campus not to exist, so they would hook onto whatever there was in the law that might be something they could work with to try to stop it. Then there was multiple permitting required, and difficult issues arose. The land made available by the Virginia Smith Trust was quite large—larger than the campus could

be. An initial selection of site had been made, guided by Dan Simmons, who was working with us as a special assistant for the Merced endeavor. Had been sparked by Dan working with Roger Samuelsen and others. Roger was sort of the business person on the project from the beginning. That was an eastern portion of the Virginia Smith property, high up, with a lot of good view. It was picked as much for the view as anything else. Eventually, that site turned out not to be tenable because of the permitting process, and we went onto other things.

However, I do remember when Dick made the decision that he would in fact visit Merced. Since that was done in a public fashion, that amounted to at least a semi-commitment to start the project. We went out there, and we were in buses, being taken around to various sites. We went to Lake Yosemite, which is near the campus. We went up on a road above the campus that was near where the site was supposed to be. I remember the two buses, which were followed by a string of press cars from the Central Valley, stopping on the road at one point. A few of us got out to look at the campus, and Dan and I were standing there together. As we stood along that road next to the fence, all the cattle came up to examine what this new phenomenon was. So there's a picture that was on the front page of the Fresno Bee and the Merced Sun-Star that has Dan and me surrounded by a bunch of cattle, with us up to here, just below the knees, in mud. That was an interesting one.

34-00:12:54

Rubens:

How did this fall under your domain?

34-00:12:57

King:

The academic starting of it. It was an academic initiative, and even though we didn't have an office of such at the time, you have to put it with the provost. Who else could you put it with? Whereas the business side of it was under Wayne, and Roger Samuelsen was engaged by Wayne and reported to Wayne. Then there was Chris Adams, who was, I guess, engaged by the office of the architect, Mike Bocchicchio, which came under Wayne, who was also involved early on then, doing early architectural thinking about it. That was just about all the team.

34-00:13:33

Rubens:

Did Atkinson have any second thoughts when he came regarding if this was the right thing to do?

34-00:13:39

King:

I think he was, again, worried about, can it be pulled off? I don't think we had any doubts that it was needed for the capacity of the university. In fact, that's one of my great worries right now and great concerns, is

that even as Merced fills up, we run out of space somewhere around 2021. Today is not that far from 2021, when you consider that the Merced campus was seventeen years from the start of the selection process to the opening. We're ten years away from 2021. There was no question that it was needed by the university for capacity reasons, and the only alternative would be making the existing campuses larger, which is academically undesirable and is a difficult thing to do as well, given community limitations and pressures. Merced was clearly needed. It was just, when could it be started in a way that it could be pulled off.

We did make the decision to start it. The strongest support it had was once Gray Davis became governor. It was a high priority for him. There were still very prominent people around the state who, to this day, say the campus wasn't needed. Pat [Patrick] Callan is an example of that, and John Burton is an example of that. There was difficulty all along. You had to sort of forecast the budget situation of the state. We also had to deal internally on this, because in meetings with the council of chancellors, a new campus is not the thing that existing chancellors want the most. There has to be a way of seeing that it will not impede their budget. So we needed to be able to conceive ways, such that the money required for this campus was in some way incremental. [That it] would come only because of the campus project. We had to deal with those sensitivity issues, and then the question of how well it could carry ahead. As it was, we moved, and I'm going to have to check what year it was, to the decision that we were finally ready to appoint a chancellor for the campus. At that point, of course, the project went to the chancellor rather than us, but there was a search, a very thorough search. I was involved in that search committee, and it led to the selection of Carol Tomlinson-Keasey, who had been the vice provost for academic initiatives, and who was a dynamo as the first chancellor of the campus. She unfortunately is now deceased from cancer. She and her husband, Blake, also went on a number of our mule-supported hiking trips.

34-00:16:42

Rubens:

She had been in the office of the president for—

34-00:16:44

King:

She had been at OP for whatever number of years she was vice provost for academic initiatives.

34-00:16:49

Rubens:

Then Lindsay Desrochers was also—

34-00:16:51

King:

Lindsay had actually been elsewhere before she went to Merced. I want to say she went from OP to Portland State in Oregon, Portland



State University, and then from there to Merced, and then back to Portland State after a number of very good years at Merced. She's now retired, and they're traveling around the country. She and her husband, George, of course, have also been on our mule-supported hiking trips.

34-00:17:23

Rubens:

When you first went to the office of the president, she wasn't there, is that right?

34-00:17:29

King:

I think Lindsay was in Portland by that time.

34-00:17:34

Rubens:

She was on the business side.

34-00:17:35

King:

Yes, and budget side. I remember, back at the time of the Tan Hall project, and going up to Sacramento to testify before the famous Jerry Beavers that I would be coached at great length, and Lindsay was one of my coaches. The other one was Sandy Smith. Lo and behold, I came to know them both much better as the years went on. So Lindsay had that role. Carol, once appointed as chancellor, did start assembling a team. Lindsay, I think, was one of the very first appointees. Not too far behind was the search for a provost, and they hired David Ashley, who had been in civil engineering at Berkeley and then had been a dean of engineering at Ohio State. Then a lot of the start of the campus, academically, involved senate. It involves senate for planning functions and their role in it, and it involves senate for hiring decisions, faculty appointments and the like. How do you do this for a brand-new campus? The answer was that the senate function was carried out by people from the existing campuses. There were people from all of those involved in senate guidance committee. One from Berkeley who worked a lot on it was Peter Berck from agricultural economics within the college of natural resources. The senate then had a committee on academic personnel. As they started hiring faculty, that committee would carry out the role of the budget committee here, with regard to evaluation of the faculty cases. In that way, I think the startup of a new UC campus profits enormously from the existence of the system. You've got the standards of the system, the policies of the system. They're already there. The people from the system, both senate and administrative, are there, ready-made, to give good guidance to the campus as it starts.

34-00:19:49

Rubens:

No doubt, Keasey's experience with the system put her into—

34-00:19:57

King:

Oh, yeah, sure.

34-00:19:58

Rubens:

I was wondering if there was any close contender. I've never had an inkling of that.

34-00:20:03

King:

There were other contenders for the position, and I'm going to have trouble remembering if any were purely from outside. I think not. I think everyone considered was from inside because it was such an obvious thing. The campus has progressed onward, and since Carol departed as chancellor, the next chancellor had been the dean of engineering at Santa Cruz, and he's now been replaced, or succeeded, by somebody who came from entirely outside the system, but not from entirely outside California or state universities. It's Dorothy Leland, who was at a high post in the Georgia State University system, and was born in Visalia or somewhere like that in the Central Valley, and so she has the Central Valley roots.

The most difficult thing in starting Merced was to gauge the timetables associated with the permit processes, the suits, and the state budget. They all had to converge together, and yet we had no control over any of them. You had to get funding from the state, incremental to the university's budget, to proceed ahead with it. You had to clear the permits to move. You had to have the lawsuits move however they would move.

34-00:21:35

Rubens:

These lawsuits were over environmental issues, primarily?

34-00:21:37

King:

Primarily over an interesting creature called the fairy shrimp. It turns out that that area near Merced has a lot of what are called vernal pools, which I might call a tarn from my mountain experience, and you might call a mud puddle. Vernal pools come into being because of the rainy season. They're there for a few months after the rainy season, but then they dry up. So there's a special form of life that lives in and near them that can handle this business of the water being there only some of the time, and burrow into the banks and hibernate, or the equivalent, or whatever, in order to ride out the dry seasons. There are only certain places within California where these vernal pools are. The fairy shrimp is, in fact, an endangered species. That was the subject of most of the permit concerns and also the lawsuits. We did, at one point, simply move the campus. It was done to take advantage of the fact that preexisting was a golf course. The golf course had gone through the permitting process and did not need the totality of permits that the grassroots building would need. The golf course is what was taken for the campus, and that is what the campus is on today.

34-00:23:12

Rubens: It was very clever, I thought.

34-00:23:13

King: Yes. I'm not sure they've even yet gotten their permits from the Army Corps of Engineers, which they need in order to expand off the golf course to other areas. I just haven't followed it that closely. The Army Engineers is involved because, believe it or not, a vernal pool is an inland waterway, and the Army Engineers have jurisdiction over inland waterways. I think the lessons learned from this are that UC can do a very good job of starting up new campuses, and those campuses can be attractive from the beginning. They did get very good faculty.

34-00:24:05

Rubens: They decided to hire at a high level.

34-00:24:09

King: They hired some of each. They hired some senior people and they hired some junior people.

34-00:24:13

Rubens: Was this your influence in terms of—

34-00:24:16

King: Largely Carol's definition, but I was there for a lot of the discussions. Actually, the one that I had more of a role in was the golf course choice. There's the engineer solving a problem again. I think we learned that you get quality fast, and it's attractive, and it works to do another campus of UC. Please don't interpret that as an argument that UC should have eighteen campuses someday. I'm not at all sure that it should, because there's another problem that comes with way more campuses. But that happens. I think we also got a very graphic case study of how difficult it is to start something like an entirely new campus. That's what I think poses the problem for the university today, if it is going to try to adhere to the 12.5 percent, or something like it, or something higher, which may be put upon us into the future. What are we going to do? A new campus project is a very long project. One answer to that is maybe the use of instructional technology somehow negates that need.

34-00:25:41

Rubens: How much of your time was occupied with Merced?

34-00:25:45

King: Quite a bit before Carol became chancellor. Substantially less once she was a chancellor, and still less once she had a staff to start doing things with her. I do feel good about the project. I did go out there to the graduation of the first graduating class. Janet Young, who used to be in the office of the president—she was the executive assistant to the presidents for many years, David Gardner, in particular—I knew her.

She had gone to Los Alamos, and then to Merced, as executive assistant to the chancellor. She seems to have done the seating chart for the commencement of the first graduating class, and that was the one where the students had carried out this great effort to invite Michelle Obama. So Michelle Obama was the speaker at the commencement, and lo and behold, my seat on the podium was right behind her. The cover of—I think it was Life Magazine.

34-00:26:57

Rubens:

That would be a nice photo.

34-00:26:58

King:

It used to be on the web, and I think I still have it electronically. Sitting right next to Rod Park, who, of course, very much deserved a place there, too.

34-00:27:10

Rubens:

The opening of the campus was delayed by a year.

34-00:27:14

King:

Let's be careful there, because it was delayed, and then Gray Davis wouldn't accept the delay. Carol had to go into a sprint. I remember that one, too. I was present for the opening of the campus, and the biggest ovation—it was in a huge, circus-like tent on the lawn there. The hugest ovation I have ever heard in my life was for Carol as this thing came into being. Immensely deserved. I also remember that we broke ground. That was what the occasion was. The ground that was broken happened to be right at the foot of the stairs to the platform that people sat on. So I remember coming down the stairs off the platform, and my foot sinks about eight inches lower than I have any expectation it will, because I'm on the broken ground. Somehow I remain standing.

34-00:28:17

Rubens:

Was Carol the first—I used to know this—the first female chancellor of a—

34-00:28:24

King:

No. Barbara Uehling at Santa Barbara may have been. Then I have to think further. There was Rosemary Schraer. She was Riverside. I have trouble placing her in time vis-à-vis Uehling. Then, of course, many others at the time of Carol and more recently. MRC. I'm not going to be able to enumerate them all. Laurel Wilkening.

34-00:29:02

Rubens:

I know that you're saying once Carol comes on and once she gets a provost, of course you're stepping back from the—

34-00:29:08

King:

It's their campus then.

34-00:29:10

Rubens: Were you consulted about—

34-00:29:15

King: There would be all the council of vice chancellors, all the council of chancellors meetings. There would be particular issues they would come up on, and then we would have a briefing meeting of a couple of hours with Dick, me, Bruce, and Wayne Kennedy or Joe Mullinix, depending on when it was, for about two hours after each council of chancellors meeting, so once a month. That would update us on Merced, and we would digest the issues.

34-00:29:44

Rubens: Just as you were instrumental in the placing of the campus on the golf course, would you point to anything in terms of the educational mission or focus?

34-00:29:59

King: That is a personal contribution from me? I think everything else would be very much in concert with other people. The digital library project had a lot to do with Merced, because that was instant library for Merced. I remember going out on a very early day to some event in Merced that had Cruz Bustamante as an assemblyman on the stage with us. It was a meeting about what Merced would be somehow, and I had to give a talk. So I picked the library as a subject to give a talk on, and the thrust of that is there may not even be a library building because of what digital is going to be able to do for us. But the way the digital library was such an asset to Merced was that that was instant library. They immediately had full library facilities. The availability of library facilities had been a huge issue at places like Santa Cruz, Riverside, et cetera. They were never able to develop print libraries to the scale that the older campuses could. The digital world changes that. It's all there, provided you have included Merced in your license.

34-00:31:23

Rubens: What about the admissions phenomena at Merced? The tie between all that you were doing, system-wide, and then—

34-00:31:35

King: Yes, and I know a fair amount about that in recent years, too, because Susan Fauroat, who is the associate director of admissions, is also a member of our mule-supported hiking group in the summer.

34-00:31:50

Rubens: How'd that come about?

34-00:31:53

King: Merced people came into the group, starting with Carol and her husband, Blake, and then Karen Merritt, who was the director of

academic planning for Merced, as well as 50 percent at OP. Then Susan. We've actually had Sam Traina, who was their vice chancellor there—was on a trip—and some others. We've had a good Merced contingent. So now, what got us on that? Oh, admissions at Merced. This is when you've got to back off. In hindsight, it all makes sense, but in foresight, you might not expect it. Here is Merced, here is an admissions system that involves eligibility and a guarantee of a spot going with eligibility, and then here are these admissions that are selective at most of the other campuses. Students who can apply to any number of UC campuses they want to, for not all that much application fee, do so. They will typically apply to a campus that's a reach for them, a campus that they think they can probably get, and then a sure thing. Students applying to Merced would also have applied to UCLA, Irvine, Santa Barbara, wherever. What kind of student is going to want to take Merced as a choice compared with one of these developed, existing campuses, especially because the offerings will be less at Merced? The majors are not as well-developed. It's a new campus. Not everything will go right. But it's also a pioneering experience, and so it's the pioneers who will go there.

The other issue would be that as you go into the admissions process, Berkeley has all of its applicants, and it's only as you get to about April 1 that we know who Berkeley has accepted and who Berkeley has not accepted—the same thing for Irvine, and the same thing for Santa Barbara. If Merced is going to get students choosing to go there because it's the one campus they could get into, or if it's a second or third choice after UCLA and Santa Barbara or whatever, it leaves a great uncertainty and a great swing in what the numbers might be. Yet Merced is deciding how much to beat the bushes to try to recruit applicants, how hard to recruit the people who have applied, and they are left with a real numbers problem that they cannot predict well how many students are going to accept. So they miss. There were some early years where they missed on the low side, and that caused some stories about lack of students going to Merced. There were also some years when they've missed on the high side. I think Merced is about where it wants to be on admissions right now.

We are in another situation right now, which is that all eight other undergraduate campuses have now declared themselves selective, not able to admit all eligible students, and so Merced is the one campus available to the referral pool. Given the fact that pioneer spirits often exist, and given the fact that there is a body of should-be university students in the Central Valley, which has been a low partaker of higher ed in the past, I think the prospects are very good for Merced filling up at whatever pace it wants to fill up. What pace should it fill up? You can't really grow the student body by more than 10 or, at max, 15 percent per year. Then you think about 10 or 15 percent compound

interest and how long it takes to grow from 5,000 to 30,000. It will take some years, but it will happen. We're not that far away from where there won't be the space anywhere, and UC has the problem of now what is it going to do to meet 12.5 percent?

34-00:36:50

Rubens:

There was a perception, I think, that Merced was getting the lower range students. Certainly some students chose it who had a pioneering spirit. It was a campus with a higher percent of minorities.

34-00:37:13

King:

That's not surprising, given the location, that it would be a good draw for minority students. Of course, that's one reason for the location, is to try to serve that population, particularly within the Central Valley. The question of a Central Valley and a UC campus goes back a long time. That was on the table at the time of the selection of the locations for San Diego, Santa Cruz, and Irvine. It's got a long history that there should be a campus in that area. Well, of course, if it's a brand-new campus and doesn't have as much to offer, and you applied also to Berkeley and Santa Barbara, you are likely to go to Berkeley or Santa Barbara if you can get in there. In that sense, Merced has been, more than others, the referral pool campus for those who are eligible and didn't get admitted to another campus. This will change. I think it's just part of what happens for a brand-new campus anywhere.

34-00:38:26

Rubens:

It's the first campus in which the whole new admissions policies are already established.

34-00:38:38

King:

That's true.

34-00:38:39

Rubens:

They don't have a history of affirmative action, and yet—

34-00:38:43

King:

But they have strong interest in it. They've had people who are very vigorous in interesting students, and getting them to come to Merced, from minority communities. I think of two people in particular. One is Chon Ruiz, who is the director of admissions, and who has worked very hard at that. The other is Joe Castro, who started at Berkeley, went to Merced, then went to Santa Barbara, then went to San Francisco, where he is now. If ever there was a multi-campus UC person, he is it. In the early days of Merced, he, too, worked on outreach efforts there.

34-00:39:26

Rubens:

Does Merced particularly have a science focus? They certainly were bringing in graduate students in biology.

34-00:39:35

King:

This is very interesting. The superficial thinking at the time of the selection and formation of Merced would be, oh, Central Valley; this will be another agricultural campus, to go with Davis. Of course, another agricultural campus was not needed, nor was it what was wanted by the proponents from Merced. They would like to do things like diversify the economy, get their citizenry prepared to do anything, and there has even been a boom-let of sorts to try to get the Merced area to become the back-up location, or the first alternate location, to Silicon Valley, to try to get high-tech companies out there by virtue of the fact that there is a UC campus there. The interests from the beginning were very heavily in things that would serve the whole populace for all sorts of functions. There was an early interest in business, which is not yet a separate school, but is nonetheless developing. It is not accidental that they formed three divisions at the beginning. One is natural science, another is engineering, and the third is—it's got a different name, but it amounts to humanities and social sciences. So yes, they have emphasized the sciences from the beginning, and that gave them some expensive recruitments to do. But they've done some good recruitments.

34-00:41:12

Rubens:

Did you have an advisory role in the structure of the academic program?

34-00:41:27

King:

I was in on the conversation on that all along. Of course, the decisions were made by the campus people once there was a chancellor. The particular decision of those three divisions was made after there's a chancellor, not before. I'm proud of that effort. I think, considering everything, it has gone well. I have full confidence in it for the future. My big worry is not about the Merced campus. It's about what the university is going to do next.

34-00:42:02

Redman:

I have to ask. You have spoken a bit about the choice of Merced, and part of that was to be able to cater to a community that wasn't necessarily catered to. I'm wondering if there was any sort of vocalized dissatisfaction from communities north of Davis. There's a lot of space up there.

34-00:42:25

King:

Yes. I've wondered that one myself, because when I got here to the Center for Studies in Higher Education and saw it as an opportunity to study things and write papers, the first effort I did was a paper on the capacity of the UC system and how to gain a future capacity. It's just so apparent that there's an upper 50 percent of the state that doesn't have a UC campus. Doesn't have a heck of a lot of CSU, either. It's



got Humboldt State and Chico State, but then you're down in the Sacramento area after that. I think this is just realpolitik, that the political strength of the northern half of the state is not great enough to pull the interest and desires up there, whereas the Central Valley not only has a lot of population, but is also a political swing area of the state, which means it's sort of balanced, Democrats and Republicans. Of those regions that can go back and forth, it's the big one. All of that is a reason to pay political attention to it.

34-00:43:52

Redman:

As I was thinking about that problem, I was just considering, it's a day trip to go between all of the existing campuses. I was wondering if the factor of physical distance played a role?

34-00:44:11

King:

No. I think it's just the lack of population in the northern half of the state. If you look at the distribution of population, it's way low there. Of course, the northern half of the state has also been hit economically because of the timber industry going away. One community I know well is Fort Bragg, up north of the Sea Ranch. Georgia Pacific had a huge operation there, and it's all gone. They're trying to recover with efforts to become a tourist area, and doing remarkably well at it. A place like that does not have the prominence on the state level or the political clout to be able to do this. That's my thought as to why the north didn't win that first selection of north versus central versus south.

34-00:45:21

Rubens:

I think there was quite a bit of lingering distress by the Fresno area that it had gone to—

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King:

That was a big one.

34-00:45:31

Rubens:

That continued.

34-00:45:32

King:

That this campus had been put in the much smaller community of Merced, rather than in Fresno. I think the answer to that is very straightforward. It's that the teams presenting and pushing the Fresno sites just hadn't done anywhere near the job that the Merced people had done. The property wasn't acquired. There were water questions. There were all kinds of difficulties.

34-00:45:59

Rubens:

You were clear about that. But I think there was a lingering political discord.

34-00:46:02

King:

Oh, yes, for a number of years, there was a big thing there. That's changed now. The issue was the Fresno Bee and what would appear in it. A lot of that was very hometown and anti-Merced in the early years. There were even efforts to try to get the decision changed to bring it back to Fresno before the construction started. Try to back off from this, where this is always an interesting question. Where should a university campus be? There's another very similar issue to this one that took place in the past, which was the location of what became Santa Cruz, because the alternative sites on it were in Silicon Valley, or on the slopes surrounding Silicon Valley. It was the availability of the Cowell Ranch that largely swung it to the Santa Cruz site. Well, was that a good thing or not? There's been a special set of issues between the Santa Cruz campus and its community, which is not a typical community. Leaving that aside, is it better to put a university campus in a more non-urban, non-packed area, or is it better to have it right where the action is? You can argue both sides of that one.

34-00:47:35

Rubens:

Did you feel strongly?

34-00:47:38

King:

I think the selection of the Merced site is a reasonable thing, and I think it will do wonders for the city of Merced, and it wouldn't have done all those wonders for the city of Fresno.

34-00:47:49

Rubens:

You can see that already. There's a lot of growth. My only thought was that it was too bad they couldn't be higher up in the hills, where at least there was some cooler weather. But people adapt.

34-00:48:03

King:

The climate is a difficulty. The winters aren't very pleasant either, with very cold fog. But people do live there, and it's a very important part of the state, and a university is concerned with the things a university does. Yes, it's been an asset to the coastal campuses to have the coastal climate, but I don't think the inland climate is a killer. It would be no way politically viable in California to put all campuses on the coast anyhow.

34-00:49:51

King:

Let's talk about the [UC] Press, which is one of the things I picked up by virtue of being provost. I had known nothing about the University of California Press before, except they had some very interesting books on California history, and their catalog would come in the mail. I had the press under me. I came to know its operation quite well. I came to know its two directors during my time quite well. The one I started with was Jim Clark, who had been there many, many years. In fact, I think the first fifty years of the press, it had two directors, each

for twenty-five years. August Frugé was the first. I did not know him ever. Jim Clark, I know very well. We keep up with them. They have a place at the Sea Ranch, too, although he's spending most of his time in New Jersey, where his wife is on the faculty of Princeton.

But anyhow, I found the press an absolutely fascinating operation. It had business issues during my time. They were part of a very fundamental, long-term trend that also includes the movement to digital books and all that. The press, of course, exists because we want a vehicle for publishing scholarly manuscripts. However, if the press just published scholarly manuscripts, it would be nowhere near financially viable. The university does put money into the press. A portion of what were called nuclear science funds were given to them as an endowment years ago. The nuclear science funds were commissioned to the university for running the National Labs. They also have some regular annual budget. It's not highly subsidized. We may subsidize 8 or 10 percent of it, but that's about all. So there is a problem throughout the nation of the viability of university presses, and most have done a version of the kind of thing that the UC Press had done, which is to publish some very nice, popular, coffee table-type books. There was a big issue of where is financial viability within all of this.

There's another interesting feature that is unique to the UC Press, which is the so-called editorial committee. There is a formal committee of the Academic Senate that doesn't just advise the press. It reviews all of the books and makes the actual decisions of whether to publish or not. You have a very interesting dynamic of there being editors at the press who solicit books, receive books, [and] know that they're going to have to get the ultimate approval from this editorial committee. That goes into their selection process as to what books. The directors have occasionally felt somewhat encumbered by the fact that somebody other than them has the decision with regard to what books to publish. It's a prized committee of the senate, and it has generally worked very positively with the press management. I don't see it as any particular liability. It's just an unusual thing that pertains to the UC Press.

They were having financial issues and went into deficit. Jim had originally made the decision to try to grow his way out of the deficit. That is to publish more books and derive more revenue that way. It makes sense, when you think of the economies of scale and the overhead associated with the whole administrative and editorial operation, to spread that over more books and more income.

34-00:54:23  
Rubens:

Wasn't the decision also to have more journals?

34-00:54:27

King:

They did do that, and they do have journals. I do not believe the journals are that prominent on the balance sheet, though. They're not that big a financial issue. It was clear that something was going to have to happen with the press to restore the finances, and that issue coincided with the search for a new director when Jim decided that it was going to take years to grow out of this situation or come out of it however he could. He was already at a well-advanced age at that point and just made the decision that twenty-five years was enough. I would certainly agree that twenty-five years is plenty. We had to do a search for a new director of the press. That search was interesting in that we were considering both people who had come out of the commercial publishing world and people from the university press world. Commercial. This is the publishing houses that aren't scholarly books. We had a very good internal candidate in Lynne Withey, who had been deputy director of the press. This all led to Lynne, eventually, and we took her on. I'm sure she felt she waited entirely too long to hear, because a search goes through all kinds of stages. Lynne came on, and I worked very closely with Lynne. I think she did wonderfully, and she did very well resuscitate the financial situation of the press.

These auxiliary enterprises—Continuing Education of the Bar is another one, and CEB did have its own deficit story—when they have a deficit, the university doesn't cover that. The university gives them a loan at an interest rate, which maybe the so-called STIP interest rate. The short-term investment pool, STIP. Or it may be a higher rate. I don't remember. I think it's STIP rate or something like it. Therefore, they, over years, had to pay back the accumulated deficit, and Lynne did that. It is a success story in a world that is still a very difficult world. As I look at the entire world of university presses, I think one of the problems is that there are way too many of them in a business sense, but any university that wants to be regarded as a strong university is likely to see having a press as part of being a strong, high-quality university. At least we have only one of them and not ten of them.

34-00:57:11

Rubens:

They closed the Southern California—

34-00:57:15

King:

Yes, she had a small office down there and closed it. They also redid the nature of the office in London. That may be gone at this point, too.

34-00:57:26

Rubens:

What did it mean for you to work closely with her? Literally.

34-00:57:30

King:

I just found her a very knowledgeable and understanding and good-to-deal-with type person. You can discuss the issues, the problems. You can dig into them. No side agendas or grandstanding or anything. It was just a good working relationship.

34-00:57:49

Rubens:

How often did this—

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King:

I'd probably meet with her once per three weeks or month.

34-00:57:58

Rubens:

That often?

34-00:57:59

King:

Yes. Same on Continuing Education of the Bar, which is a less integral operation. A similar story, though. Just a couple of words about that. CEB provides continuing legal education and legal updates to the state. It is a service the university gives. It has strong competition from the private sector for doing the same things, and the private sector can pick off their low-hanging fruit, meaning they can give courses in San Francisco and don't have to give them in Redding or Chico. CEB had a difficult economic situation, too. That one led to a director search, and the new director also came from inside, and I think is the one person who worked with me at OP who is still in office. That's Pam Jester. Very much a business person. Of course, we've had the change that CEB not only reports to the provost, it reports to UCLA. That [CEB] also was a place where I did spend time, chaired the oversight committee for it, and we had to adjust to a new business situation with it.

34-00:59:36

Rubens:

I have a leftover question. Were there any multi-campus research units that you were pushing for Merced?

34-00:59:58

King:

They have an ORU at Merced called the Sierra Nevada Research Institute, which has been there from the beginning. That's what Sam Traina, who I named as a Merced participant on our hiking trips, has had responsibility for. The ORUs report to the campus. So no, I did not have a Merced MRU issue. I do have one, if you've got a minute, and that is that the Natural Reserve System is, in a sense, the biggest multi-campus research facility we have. It, for years, had been under the vice president for natural resources. I felt, and even the vice president felt, except for the political pressures on him, that it belonged with the provost instead. Just about the last thing that happened in my term as provost was the switch of the Natural Reserve System from the ag side

of the house to what is now the office of research and the vice president for research.

34-01:02:13

Rubens:

My leftover question, you were never approached as a scientist, science faculty, to be on the UC Press editorial board?

34-01:02:29

King:

Oh, no. They don't have a lot of scientists there.

Interview 16: October 6, 2011

Audio File 35

35-00:00:02

Rubens:

We thought that because you've just come back from an event with the American University of Armenia (AUA), that this would be a good place to start today and continuing with your many roles and jobs as vice president of the University of California system.

35-00:00:33

King:

Well, when I came to be involved in the American University of Armenia, it was a surprise. You may remember I indicated that I had relatively little warning that I was going into the position of interim provost for the university. One of the things I discovered as I entered that office on August 14, 1995, was that I had a calendar and my calendar went many days into the future with things on it. So I looked at the calendar jointly with my staff to find out what this was that I would be doing. And somewhere, a few weeks down the line, was a Friday with a line drawn through the whole day and the four letters AUAC written in. I said, "What is AUAC?" And they said, "Oh, that's the American University of Armenia Corporation. You, by the way, chair the board." "Oh." And so I learned about AUA. I chaired that board all the while I was provost. I chaired it for about a year and a half to two years afterwards. That is, Marcy Greenwood never became the chair of the board. And Rory Hume, once he was provost, did become chair of the board. So for his period, I was not [the board chair]. And then when Hume left to go to the Emirates University, where he's provost now, the university had a lot of need for a board chair who could pay a lot of attention to it. As a result, I've been in a second term as chair of the board of the AUA corporation and foundation. We'll get to that. Pardon me, and fund. The F in AUAF stands for fund. And prospects are that I will do that at least until sometime in 2012, since the game plan has been for me to turn it over to the sitting provost who has now indicated that he's going to resign next February and so it makes no sense to give it to him for four months.

So anyhow, to back up. The American University of Armenia is a joint venture of three parties. The three parties are the University of California, the Armenia General Benevolent Union, and the government of the Republic of Armenia. I'll get into the roles of each. But the way it came about was that there was a large earthquake in northern Armenia in 1989 and an NSF team was sent over there, arriving there just a couple of days after the earthquake to look at the damage and assess what might need to be done in the very short term. And one of the people who went over on that was Armen Der

Kiureghian, who is a professor of civil engineering here. And during that visit, or one soon thereafter, he was together with a few others over a breakfast of what he described as ganache or something like that. And the idea of creating an American University of Armenia came up. The other co-founder in a conceiving the idea sense is a man named Yuri Sarkissian, who was at that time Rector of the state technical university in Armenia. And, of course, in 1989 this was still the Soviet Union. There was no separate country.

So in the period of 1989 to 1991, people like Armen and Mihran Agbabian, a professor at the University of Southern California, went to contacts in various places. And one place they went was the Armenian General Benevolent Union (AGBU), which is a huge charity operation of the Armenian diaspora. It has offices throughout the world but it's headquartered in New York City. And at that time the president of the AGBU was Louise Simone. Louise Manoogian Simone, of Armenian American descent, whose father was the inventor of the one-handle faucet. He had obviously capitalized on that for very substantial wealth. And her father died—I believe it was just before or just after I became involved with the university. And she then became the manager of his fortune, as well as the AGBU. Louise bought into this and they had conversations as to who else to get involved to help start the university from an academic side. And various people were mentioned. And Louise is reputed to have said, “Well, I don’t deal with people as individuals with things like this. I deal with institutions. So get me an institution.” So the conversation then went to the University of California would be the right institution. Why? Because Armen was a professor with the University of California. There is a very substantial Armenian American population in California, particularly in Glendale and Fresno. And the governor at that time was named George Deukmejian. And, in fact, there were some regents named Kolligian and Khachigian—at that time. So it looked like a good state service or state community service sort of thing for the university to do and that approach was taken to David Gardner, who, after a couple of months, responded positively and assigned Bill Frazer, his provost, to oversee the development of the university.

So it has been set up and has operated ever since with a corporation called the American University of Armenia Corporation, which is a California corporation and which is headquartered in UC space in the Kaiser Center. We [i.e. UC, not AUA] do still retain three floors in the Kaiser Center and [AUAC] has a small office there directed towards things that relate to the University or deal with fundraising. So in that way UC became the academic parent of the university. The board was created, of that corporation, was created to be half UC people and half prominent Armenian Americans, many of whom are members also of the AGBU board, including that the new president of that board, Berge



Setrakian is a member of the AUA board and has been all along. So there are very close ties.

AGBU took upon itself to obtain and provide the funding to start the university off with an understanding that this would be start-up funding and it had to move to other sources of support as well. The University of California agreed to take the primary role with regard to academic definition and securing academics to staff it, including presidents. So the third partner is the government now is the Republic of Armenia. And it happens that the university opened its doors on September 1, 1991, which is also the very day when the Republic of Armenia came into existence following the breakup of the Soviet Union. So the government of the Republic of Armenia is the other partner to the extent of furnishing the university the use of a building, which is in a very prominent location in Yerevan, the capital of Armenia, and was formerly, I believe, a communist youth training building. So we have had the use of that building on loan as the university has gone on, and it's now twenty years old. That's why I was there, is that we had a twentieth anniversary week of events. And as of having gotten to the twenty year point, the university now has a second magnificent building, privately funded, that actually has increased its space so much that the university can now grow substantially. The donor on that building was another board member, Ed Avedisian, whose career has been as principal clarinetist of the Boston Pops. It's Ed and his wife who are the donors. Ed describes his ability to do this as being a result of having invested wisely.

35-00:11:10

Rubens:

Why is it in the interest of UC to take this role?

35-00:11:15

King:

Well, UC was doing things of that nature more in the days back there twenty years ago than it is able to do now because of the budget situation. I suspect this is not something that UC would take on if it was fresh today. But the idea was to deal with a foreign university in a singular and focused way. We do have things like the education abroad program, which is in forty-six countries or some number like that. And we often get approached: would we have a partnership on a large scale with this university or that university? But almost never has UC created an intense one-to-one partnership that is a high priority among things that it does. And I take as my counter examples NYU's operation in Abu Dhabi as very targeted and large, but different. MIT's involvement in Singapore and Yale's new involvement in Singapore are examples of targeted one-to-one things. UC just hadn't done that and I think what swung it was the fact that it was our own faculty pushing it, and that, frankly, it probably was a useful political component for dealing with the governor. And that there is a

substantial population in California that is Armenian American, more so than in other states. So that's my interpretation of the driving force.

35-00:13:10

Rubens:

Is it oriented to science or is it a full university in the sense of humanities, social sciences?

35-00:13:22

King:

No, it is not. It is a professional university. So it was started with professional master's degrees, the idea being not to compete with the existing universities from the Soviet era, in that they all had undergraduate programs but not much in the way of graduate programs. The graduate level appeared to be the place to start. And rather than plunging into the PhD immediately, it was thought that the better thing for the country would be more practical professional areas that would produce graduates of very direct use to the country. So the fields represented there are business, as the largest master's degree, law, engineering, and it's industrial engineering, not a complete spectrum of engineering. Within or close to engineering there has now been generated, since the start, a program in computer science and then I've got two more. One is political science and international affairs, which, if I were giving it an American name, I would call public policy. It looks a lot like our school of public policy. And then there is the teaching of English as a second language. Over these twenty years, we have now produced most of the English teachers in Armenia. And that's significant. Armenia is, as was very apparent to me on this last trip, a three-language country, and English is the third among these. The first is Armenian, which is itself a very distinct classical language, and they use it primarily and heavily. The second is Russian, a holdover from the Soviet Union days, and the third is English. However, there was a conversation during this past week when one of the officials of the Armenian government just threw into a conversation, "Of course everybody will be speaking English in five or six years." Well, that may be a little optimistic but I think in ten, in fifteen years, that is probably the case.

35-00:15:54

Rubens:

How many students about go there?

35-00:15:56

King:

This is small. It is 350 students among these programs, a little under half of them being in business. And the objective now is to expand this population to 1,600, because right now, today, there is a proposal that I'm sure will be approved by the board and is wanted by the government and will hopefully be accredited by WASC, who is the accreditor. That's another part of the story. This proposal is to add an undergraduate program and so it's going to start off with computer science but it's also going to have law, undergraduate, interestingly

enough, and business and economy. So that will grow the university. That's very important when we talk about the financial structure of the university.

35-00:16:51

Rubens:

You said the board is half UC and half prominent Armenians in the US. How big is the board about?

35-00:17:05

King:

The board is about twenty.

35-00:17:08

Rubens:

And why would there be no representation of the Armenian government?

35-00:17:15

King:

There are in fact two boards. There is the American University of Armenia Corporation, a US California corporation, and there is the America University of Armenia Fund, which is the name given in Armenia to such an enterprise. It is the American University of Armenia Fund that operates in Armenia. So if you want a giant picture of it, much of the oversight and guidance are given by the American University of Armenia Corporation. The private funding, AGBU or otherwise, comes to the American University of Armenia Corporation, which in turn writes a large check to the American University of Armenia Fund for monies that are now in Armenian drams and which can be spent in Armenia. So there are two boards. The AUAC board does not have somebody from the government [of Armenia]. The AUAF board does. And the AUAF board is seven people. I get to chair that one, too. It is all members but one of the executive committee of the AUAC board plus two people from Armenia, Yuri Sarkissian, who I mentioned earlier, and whoever is the sitting minister of education and science, which is the pertinent ministry in Armenia.

35-00:18:55

Rubens:

So you want to talk about the financial structure.

35-00:18:58

King:

I'd like to talk about that, yes, and the political structure also. And also the academic structure.

35-00:19:04

Rubens:

I can't quite understand why it's called a corporation.

35-00:19:15

King:

Well, it's how it becomes tax exempt. We're not a university in the US. We are a 501(c)(3) organization. So that's the reason for the C. There could be some other word on the end. But it's a very complex governance structure because of the two boards. Because, also, of the fact that the Armenian government flows one way or another as years

go on and they have an interest and a history of being much more involved in their other universities than they are in this one. So there's some concern about too much government in what is in fact a private university.

Just to complicate the structure a bit more, there are the universities that are holdovers from the Soviet era; there's ours; there's a French university, which could be thought of as the French university of Armenia; and there is what is called a Slavonic or Russian University of Armenia. The Slavonic one is something different but the French one is in the mode of a private university. So private universities are not a familiar concept over in that part of the world. That's one of the complications.

Where would you like me to go from here?

35-00:21:02

Rubens:

Well, you pick the order. So financial structure, political and academic.

35-00:21:06

King:

Yes. Well, let me try to put the academic thing in order a bit more. I gave you the rationale by which the original six disciplines were picked, but an interesting thing has happened in Armenia and that is that graduate education has developed at these other universities. That was a goal of the government. The government likes the fact that we in effect spurred or catalyzed that. But another tradition has developed, which is that you go on to graduate work at the university where you went undergraduate. Well, we don't have such a feeding mechanism. So the intention is to join that same mechanism, have our own undergraduate program and do two things. One is, yes, as the others do, draw on our own undergraduates. But secondly, try to promote more of a climate where students do go back and forth between universities, between undergraduate and graduate because that's an American concept that's a good concept and we're trying to bring those American and Western concepts to Armenia. So that's why we are considering the undergraduate program and the intention to go in that direction. Not far behind that is the aim to have more permanent faculty and enable them to do research more and thereby add a PhD program, which would go with their doing research as part of their jobs. Right now a lot of the faculty are not permanent and is people, a year or two, three years at a time, something like that. The university does not have, and cannot really, realistically, have tenure yet. It doesn't fit the financial structure. As a result, the faculty members are all on contracts of a year, which the current president is trying to lengthen to two years.

35-00:23:21

Rubens:

Are they all Armenian faculty or do they come from abroad?

35-00:23:23

King:

No, we try to get as many as we can come from the US, or who have had American educations in their backgrounds. The nationality is less important than where they derived their own education. And we do want ones with Western and hopefully American educations. So that's something we try to promote and that's the concept behind an American university of someplace. Like the American University of Beirut is to have American-style education and the faculty have to know what that American-style education is.

So that's, in a nutshell, in terms of the academic sense of it. I think there's a good story to be told there in that one fear has been that these graduates would leave the country and go use their education to make a higher salary somewhere else. And some have. But at least 80 percent are still there. And on this last trip over there, I met a deputy minister of defense who was an AUA grad and I met a deputy minister of justice who was an AUA grad. So it's getting there. That's sort of the academic story.

And the financial story has to tie to that. That's had a very interesting history. As I said, it was founded with AGBU money, and what AGBU did was to raise money expressly for the use of this university. And so there are two kinds of AGBU money involved. What they raised and hold in their endowment for the use of the university, which I'll call the core yield. And they've raised monies for general purposes, a substantial amount of which they had devoted to the start-up of the university. Those, however, were never promised in perpetuity and they have now gone away. So there was a certain appropriation for the early years. Then it went down by stages and now it's just the yield on the money that is formally designated by gift for AUA. That's one source. Now, where to get other monies? Well, the second route always is to have fees for students, but we are not able to have those fees be all that much above what the fees are for the other universities, or else we don't get students. So we do have fees, we do have scholarships. There is a yield from this, but it is not that large a fraction of the budget. It's the third-largest part of the budget. And the second-largest is the yield from a USAID grant made to the university. This is done for many of the American universities abroad. It was done by finding interested people in the US Congress and by actually getting a rider on a bill that instructed the USAID where to put the money. This was not in any way unusual for these overseas ventures, though of course, it was a complete violation of UC's own policy with regard to earmarks. But nonetheless done. So there is an endowment that was ten million dollars that came from that source.

Unfortunately, it came not so long before the economic collapse of a few years ago and so its principal is well under that value now.

35-00:27:28

Rubens:

So it was under you that the search for funding and the negotiation for it takes place?

35-00:27:36

King:

Well, that's while I was chair of the board. Yes.

35-00:27:39

King:

The dealing with Congress was primarily a function of the Armenian American portion of the board. In fact, entirely so, not the UC portion of the board. But that's a completely right thing for them. The mechanism is not in the UC style but then that's how things are in other places. And there's one other principal funding mechanism, which I will call auxiliary enterprises. A building was built in downtown Yerevan, not near the university, that is called the AUA Center and that was a gift-funded building, from Mrs. Simone primarily. And it is used a little for AUA's own purposes but more so it is rented out to corporations or other operations that rent space in downtown Yerevan. And so off the rental income we're deriving income. And then one of the original board members from the Armenian American community, Vartkes Barsam, had built a hotel in Yerevan and when you look up on Trip Advisor or one of those websites, it's the number six hotel in Yerevan. He passed away and in his estate he left this to the university. So the university has its own hotel. That's where I stayed last week. It's a perfectly fine hotel. A little awkward in that there's no food service but there are refrigerator and microwave and I got to go to an Armenian grocery store to get [some of] my food. So that's another revenue source. So really there are the four sources of funding. The private funds, the USAID money, the business revenue and student fees. However, there have been financial problems in recent years because of the economic collapse and the fact that so much of this is endowment. The USAID money was given to us in bulk and therefore it's endowment, residing, incidentally, and managed by the UC endowment people. It's just a part of it and gets the same yields. And, of course, the private money, particularly what is held by AGBU, was affected by the stock market and so forth. Only the fees were not. So it's been difficult the last few years. I would say that right now the university does not have a viable financial model and so what this undergraduate program planning is about is to create a viable financial/academic model.

The political circumstances of the university have been interesting. The government changes rather often and so there's not a lot of stability to it. Like the other former Soviet Union countries, the people in the government tend to be people who were in the old Soviet Union

governments. They are now not communists but capitalists. A lot of their views and methodologies hold over, which can make for some interesting dealings. We have had some episodes during the last couple of years where we thought the fingers and thumbs of the Armenian government were in too deep and we've had to deal with that. But on the whole they've been a good partner and they do view this university as a way of bringing desirable educational innovations into the country and we are looked at positively. There's been another interesting issue that pertains to the government and just a sideline on the university and that is in Armenia draft deferments are a very big issue, and the reason, of course, is that the country of Armenia is still with very unfriendly relations to two of its neighbors, Turkey and Azerbaijan. When you look at a map, it's extremely complicated geography. There are pieces of Azerbaijan on either sides of Armenia. And then there's Nagorno-Karabakh within one of those portions of Azerbaijan, which is Armenians and is claimed by Armenia. It is also claimed by Azerbaijan and a war was fought over it ten years or so again. So there's an Armenian army. And it drafts college aged men. An interesting phenomenon we found a few years ago is that the student population of our university had become 75 percent women. And the reason was that there were these draft deferments that are given out by the government apparently sometimes in ways that are under the table and appeared to a much greater extent at the other universities than at ours. And so the men were going to these other universities so as to get a draft deferment. And that touches upon another issue, which is that Armenia is a country that still has corruption stemming from the old Soviet days, and one of the big roles of this university has been to be a bastion of incorruptibility and thereby try to set that model in force into Armenia. That is felt by some of our Armenian American board members to be a huge role of the university.

35-00:34:37

Rubens:

How often did you meet with your boards? Your two boards?

35-00:34:41

King:

The AUAC board meets twice a year and then there's an executive committee of six people that meets usually by telephone. The board meets in person but the executive committee is empowered to act for the board and can meet by phone with whatever frequency is needed, and that is perhaps typically four other times per year. We have had three presidents of the university. I should say something about that. The first was Mihran Agbabian, whom I've already mentioned, who is now an emeritus professor from USC, but who was very instrumental in getting it going. He lasted about five years. His age really dictated that he needed to step down. We had a second president who had been our dean of public health and who was a professor at Johns Hopkins. His name is Haroutune Armenian, which is very appropriate. Dr.

Armenian for the Armenian University. He was president for thirteen years. And since I've been back on this second term, we have had several things go on. One was a complete presidential search and the appointment of a new president. Another was getting that new president started and a third was through the generosity, again, of Mrs. Simone, we have had a study by McKinsey Corporation of the university and its financial setup. We blended that in with the academic planning to get these new directions to go forward. So that's what I've been doing the last two and a half years of being a returned board chair.

The search took quite a bit of time. It was a very interesting process. There is a population of candidates for such positions that are people who just go from one "American University of" to another or who are somehow involved in international education. We went into this search with no prescription that the new president had to be Armenian American, although obviously it would be useful if for no other reason than the language. We got Bruce Boghosian, who had been for a number of years chair of the math department at Tufts University and who is a product of UC Davis and Livermore before that. And actually, his UC Davis dissertation research was done largely at Berkeley. So there's a tie back in here. He's an applied mathematician. His research at Berkeley was, of course, done right here in this building [Evans Hall] above us. He's very good and is addressing all the problems while learning the Armenian language. He didn't know it at the time of accepting the position.

35-00:37:51

Rubens:

Now, are they contracted for certain period of time?

35-00:37:56

King:

With him we've done a three-year contract, and the reason is that he had to get a leave from Tufts. Fortunately, Tufts is a university that does have a lot of international orientation. I think it'd be very hard to get a three-year leave from Berkeley for something like this. You'd get one and probably two but not the third year. So he's doing it with a leave from Tufts, which means at the three-year point he can make a decision to go back to Tufts. And we are, of course, hopeful that he won't make that decision that way.

35-00:38:33

Rubens:

What's attractive for someone like to run that?

35-00:38:36

King:

The heritage, primarily, and the fact that this country represents a real change in building opportunity. What you accomplish there is exceedingly visible and I could see that in the various things we did during this anniversary week. For example, another very large gift to



the university was from a man named Jerry Turpanjian in Southern California. It is the Turpanjian Rural Development Program and it is headquartered up in the northern part of Armenia. Dr. Armenian, the former president, now heads that operation. And it is trying to bring sensible and workable business enterprise to exceedingly rural communities. So, example: we went to a community of maybe forty people and we went into a house that may have three or four rooms and here in one of the rooms is a huge stack of waste paper and a machine that's indeed a chemical engineering operation that is pulping that paper and laying it on mats and drying the mats so it becomes new recycled paper. This is in a house and being done on a very small scale. But there is such poverty as a result of all the change in rural Armenia and rural any other of those countries that things like this are much needed.

35-00:40:22

Rubens:

Well, you spent so much time dealing with issues of admission and outreach and diversification. Was that something you were paying attention to when you inherited this role?

35-00:40:37

King:

The answer to that is interesting. It was set-up at the very beginning of the university that the understanding and the tradition should be that the UC provost chairs the boards. Why? Well, for the mark of stature, for the means of access to the top administration of UC and reasons like that. Does the provost have the time to do a good job on this? No.

35-00:41:13

Rubens:

Did you have staff under you specifically for this interest?

35-00:41:14

King:

No, I did not have staff assigned to it, although there was a former provostial staff member at OP who had actually been there for my first two years in office. Theony Condos, who had left OP and moved to Santa Barbara but who retained a position quarter-time with AUA, an employee of AUA, not of UC. Serving as the board secretary, serving as their coordinator for the accreditation process, and as the admissions officer. Now, the admissions function is moved to Yerevan, where it should be. But the board secretary role remains for that position and the accreditation coordinator role remained. Theony unfortunately is ill. She has had to resign that post and we have a new person in that position who was formerly with the Academy of Art Institute in San Francisco as provost.

Accreditation is another interesting story. This is the first overseas university ever accredited by WASC, the Western Association of Schools and Colleges. Well, how'd this happen? The university of course wanted accreditation because here it is in Armenia saying it is a

university in the American style, and represents good American education. What better to have than the good housekeeping seal of approval from WASC? So that's why the university wanted it. The Armenian American community on the board very much wanted it. WASC was approached and WASC had never done an overseas university before and didn't want a whole lot of overseas universities. I think some overseas universities, possibly Beirut, had been accredited by other [U. S.] regional agencies. But WASC hadn't. And so it was because of the University of California connection that WASC was willing to do it. In fact, my first two visits to the university, actual visits, were after I was UC provost and while the WASC accreditation process was going on. I went there when the WASC team was there on two visits. So this time recently was only my third visit. That's another reflection on how well the sitting provost of UC can do this job. There is an issue there for UC and I don't think we have a resolution yet. There are reasons it should be the provost that are attractive to the Armenian-American community but the provost can't really apply full force to what a board chair should be doing. As I realized when Bruce Boghosian came on, the new president, one of the first things we did was to send him to Harvard summer school for new university presidents. So he went. And he comes back to me and says, "Well, how often shall we be talking with one another? One of our big topics of discussion there was how often the board chair and the president talk. Would twice a week be good for you?" And while that is typical of university president/board chair relationships, that would be very difficult for the sitting UC provost.

35-00:45:15

Rubens:

Sure, of course.

35-00:45:16

King:

We've got to find some way to do it that gets the glory and stature of the UC provost and also the right amount of attention.

35-00:45:29

Rubens:

Have there been significant critics or at least persistent critics of UC's entrepreneurship, relationship to this university?

35-00:45:47

King:

I know of no critics. In fact, there's an inverse story which Bill Frazer loves to tell, which is that he got the role, as the provost always does, of presenting this to the regents as a regents item because the affiliation is formally adopted by the regents and that was the item. They did the whole thing. It's the one time he ever got a standing ovation from the regents.

35-00:46:14

Rubens:

Oh, no kidding. Interesting.

35-00:46:16

King:

That's his story. So the regents loved it. I think in terms of doing things that are good for the world and very appropriate for the university to do, it gets high marks. I do think that things have changed enough in the university. So if the question arrived de novo today the university is probably unlikely to do such a thing because it's going to look upon it as a diversion of effort and it would be tested in terms of what dollar revenue it would yield to the university, which is zero. The university does get political credit out of it.

35-00:47:01

Rubens:

When I asked you about issues of admission, I realized there's an admissions director there but I didn't know if you were particularly pushing rural representation there.

35-00:47:17

King:

No, we've just tried to hold a good standard. Everybody cares about that. And so we want to get good students in and have ways in which we know they are good students because a goal of this operation is very clearly to produce leaders of Armenia. So we want people who are going to be able to and want to move on to do that.

35-00:47:40

Redman:

You talked a lot about the admissions criteria for UC. What are the admissions criteria for American University of Armenia?

35-00:47:51

King:

Grades and test scores. I don't think we've gone to comprehensive review.

35-00:47:57

Rubens:

Was there an effort to draw students out of those areas?

35-00:48:09

King:

Yes. We're trying to do several things there. One is to introduce the concepts of American style education. Another is to produce leaders of the country. A third is to transmit and help bring in American type values, i.e., the corruption issue. There's another issue of that sort which has arisen which is how University leaders should be chosen. Left alone in Armenia it would not be the same criteria that are used here in the US. There would be more criteria being in the in circle, government oriented, et cetera.

35-00:49:01

Rubens:

Isn't there also some special relationship that UC also has with Mexico?

35-00:49:10

King:

Well, there was, and that's worth talking about a little because those were initiatives during my time. We actually developed two, going on

three, overseas offices, so to speak, of UC. This is above and beyond the education abroad program. And the two that got going well were London and Mexico City. So the idea on both of these was to have an office that could do academic programs jointly with local universities, that could be of whatever assistance was appropriate in establishing research relationships that people wanted to make between UC and that country and also providing a springboard for alumni events in those areas. So those were the objectives. For the one in London, we made the directorship of that office an additional function of the head of the United Kingdom education abroad program. As it happens for the United Kingdom there are three EAP directors who are UC faculty over there. And one is principal among the three and the other two are not in London. They're in Scotland and Ireland and such. But the principal one also served as the head of that office. And then, actually, as staff to that office, Niall Mateer, who was one of my people in the office of research in OP, my one year there, went over and was sort of the executive director of that operation. John Marcum was who I was working with in the setup of these because he was the director of the education abroad program and had actually brought forward the initiative, which we liked. Mexico City was a bit different. There we actually bought a casa that was an enclosed compound of about three buildings, four buildings, and went heavily there in academic program trying to get things going through it. That also related to the interest of some in the legislature and so we did have some legislators who would want to go there for a while or have somebody there or whatever, having to do with California/Mexico interactions. We were headed toward a third one in Asia and in my time that was based at the Chinese University of Hong Kong with a guy named—I think it's Tom Jameson who had been an EAP director there, for us there, and who remained. That subsequently moved to Shanghai after my time, when the Ten-Plus-Ten initiative was adopted by the administration with Chinese universities. Pairing the ten UC campuses each with one Chinese university. All of that has—certainly the London and the Mexico City operations have become much less now. The London operation is gone. I think we still own the Mexico City property but not as much is happening. And I believe there may still be a Shanghai office. I'm not sure but I don't think it has as much academic role. And these are all results of contractions associated with the budget situation.

35-00:53:16

Rubens:

Was the Ten-Plus-Ten under you?

35-00:53:19

King:

No, the Ten-Plus-Ten was later, Dynes administration. It was Dynes and Greenwood.

## Audio File 36

36-00:00:00

Rubens:

There's a center that we haven't talked about that had been on our list, the White Mountain Research Center. Is this an appropriate time for that?

36-00:00:18

King:

Yes. That's an interesting operation. That is located over on the east side of the Sierra and it has primary headquarters in Bishop, California, down at a sensible altitude of 4,000 feet. But it also has a large installation called the Crooked Creek Station at about 10,500 feet in the White Mountains. They're the range next to the—east from the Sierra, the other side of Owens Valley. And it has a Quonset hut at 12,000 feet called the Barcroft Lab and it has a little stone hut on top of White Mountain, which is the second highest mountain in California, after Mount Whitney. So this is originally US Navy and it was then given to or taken over by Nello Pace, who was a Berkeley professor, and who did high altitude research up there for years. It then was made a multi-campus research unit, which is what it was in my time. And it went to the campus where the leader came from and so it was with Clarence Hall, a geologist at UCLA for over a decade. And Clarence was the director when I came into office, in the Office of Research and found I had responsibility for this. Then it went from Clarence to Frank Powell, who is a San Diego professor, and therefore it's at San Diego, headquartered there now.

It is a high altitude research station that has been used for a variety of purposes. Originally it was physiology of people and mammals at high altitudes. It has also had elements of the things that grow at high altitudes. It was, by my understanding, the alternate site for the Keck telescopes and there has always been some astronomy up there. Obviously that's high and clear skies. So it is, in a very real sense, a field station to which people who have research that want to use it can go. And there are users from outside UC, too. So I had always known of the existence of this and thought I should really, given my own outdoors interest, find a way to become involved with it, and lo and behold, by becoming vice provost for research at the system level here it was one of the thirty-five MRUs under me. And it happened that there was a dedication of the new building for Crooked Creek shortly after I came into office. And that building was an architecturally designed complex log cabin that had been on a street in downtown LA and had been bought by Clarence Hall with university money and was transported log by log up to Crooked Creek, with each log numbered so that they would know how to put them back together. And to finance this, Clarence was very creative. They were selling logs. So if you gave donations of a certain size, you got a log and you got your

name on the log. Jean and I have two logs up there. We've never been in to see them but we have been to the station and I've been there about three times. In fact, when we spend our month of August over in Mammoth Lakes, more often than not we'll find a day to go up there to near where the station is and then there are the two groves of bristle cone pines right up there. You can take beautiful hikes and photograph. Every amateur photographer wants to take pictures of bristle cone pines. I have lots of pictures of bristle cone pines taken up there.

So there was an issue during my time, and it fits with something else we should record here. The Natural Reserve System was quite interested in taking the White Mountain Field Station in because it was of the nature of the Natural Reserve sites and because it was more handsomely funded than the Natural Reserve sites and that was the very reason why the White Mountain people did not want to go into the Natural Reserve, was that they had a better funding situation, more staff, more facilities, et cetera. There was always an issue of finding the UC people to use that facility. That is, making sure it was known, because it's one of many things you're going to advertise. It has to be found by people who would want to use it. That was one thing we would work on. The Reserve System felt it was more able to do that. So it happened in two degrees. In my last year, actually, I think my last six months as provost, we took up the question of transferring the Natural Reserve System from ag and natural resources to academic affairs and the office of research. The research that uses the reserve is not even primarily from the ag and natural resources departments. It's more from plant and botany type departments or physiology and medical schools or astronomy. So one of the very last things that happened while I was provost was that we did transfer the natural reserve to the provost. Subsequently, White Mountain has been transferred to the natural reserve under the provost and I think they're much more comfortable with that, having natural reserve bringing them into the provost rather than into the vice president for ag and natural resource where there are all sorts of other issues associated with state agriculture and government agriculture, research support and eleven month appointments and what have you.

36-00:07:03

Rubens:

So you transferred it? It was under your tenure as the provost for research?

36-00:07:08

King:

Under my tenure as provost we transferred the Natural Reserve System. After my time there, and I think maybe with the arrival of Steve Beckwith when they moved research from being a vice provost position to a vice president position—Beckwith is now a vice president

for research but still reports to the provost. It was with that and the desire to strengthen that structure that White Mountain was brought to the Natural Reserve. I know people connected with White Mountain, and, of course, it shows up in the newspapers of the eastern Sierra all the time. They love its two summer open house weekends. For one thing, those are the two weekends when you can get a head start on climbing to the top of White Mountain because you can drive to the Barcroft Lab, which you can't at other times. So I believe it's a happy situation, a good situation. It's a very impressive facility.

36-00:08:11

Rubens:

Who makes these decisions? When you say then it went to someone at San Diego and then it was under UCLA? How are those—

36-00:08:20

King:

When a director would cease his or her tenure for a station like that, you get into a director search. And this wasn't true of all MRUs but for that one it really had to be that the headquarters of the MRU went to the campus of the director. And it wouldn't make a lot of sense to have Frank Powell of San Diego directing a unit for which his office was at UCLA or Berkeley. So that's why we would transfer the location, is because we transferred the directorship. We'd run an all-UC search for a director.

36-00:09:00

Rubens:

And when you say we, it's under your office?

36-00:09:02

King:

That was a function of the office of research: to fill the directorship of the thirty some odd multi-campus research units.

36-00:09:08

Rubens:

It worked for all of them like that?

36-00:09:10

King:

Yes.

36-00:09:10

Rubens:

We should have a list of those at some point.

36-00:09:14

King:

Those MRUs were subsequently removed from the office of the president with the recent changes and each was supposed still to operate system wide but had simply been transferred to a permanent lead campus. As I indicated earlier, that decision has now been reversed and the MRUs are now back with the Office of research at OP, which makes sense to me. Now, you would not have been able to do that [i.e. move it to a campus] with White Mountain. A question would arise because White Mountain's now not an MRU and it's in

the natural reserve. But you couldn't do it with White Mountain because the pool of potential directors is very small.

36-00:09:49

Rubens: There are all sorts of little entities that UC owns and that campuses own.

36-00:10:00

King: Well, and one of the sayings that I've heard often is the sun never sets on UC. The education abroad program is the primary reason for that.

36-00:10:07

Rubens: I am surprised that there isn't a center in Asia. You would think, because of how involved the system is with the Pacific Rim. A lot of time is spent fund raising there.

36-00:10:20

King: Well, I've seen a history of those things. Back when I was provost for professional schools and colleges here on the Berkeley campus, Berkeley had a Tokyo office and a fellow named Eric Rutledge headed that. He would make liaisons of one sort or another in Japan. I went over to Japan on a visiting and fundraising trip on which I had been prepared by the development office. And Eric was my guide around. He took me everywhere.

36-00:10:51

Rubens: We had talked about that but I'm surprised that it's folded now.

36-00:11:00

King: Yes. I think there's a question of economic viability of the office. Can you fund a full office over in a place like that?

36-00:11:05

Rubens: So I think we should turn to industry–university collaborative research.

36-00:11:17

King: So this was an interest, a strong interest of mine, but also a very strong interest of Dick Atkinson. We will find, when we look at the history of that program, that it was started about 1996, or with the arrival of Dick as president of the university. And I remember when we did that, it was a set of budgetary initiatives that Dick very much wanted. I think I mentioned this episode earlier, but it was one of the occasions where sitting next to me on an airplane he gave explicit instructions as to what he wanted. One of the things he wanted, interestingly enough, was the name: Industry–University Cooperative Research Program. And you can find out why if you Google that term. If you Google that term, you will not find UC programs, you will see NSF programs, National Science Foundation. And the Industry–University Cooperative Research Program of the National Science Foundation had been started by Richard C. Atkinson when he was the director of



the NSF. This was a point of obviously great pride and pleasure to him. So he wanted to replicate this idea at the level of the university. And in those days, the budget was in the form of a compact with the governor or a partnership of the governor. We can discuss this more when we get to Larry Hershman. But it depended whether it was Republicans or Democrats as to whether it was a partnership or a compact, and I've forgotten which was which. But the idea was that we tried to guarantee a minimum budgeting level for UC within the governor's budget by this arrangement, which was then pegged to enrollments and pegged to the university meeting certain accountability measures.

36-00:13:26

Rubens:

Let's articulate first what the purpose of the program is.

36-00:13:32

King:

Ah, the purpose of the Industrial University Cooperative Research Program is to get universities and industry working together cooperatively in research and to have that research be co-funded by the program and by the companies and to pick areas of research that will feed immediately into the economy of California. Those are the goals.

36-00:13:55

Rubens:

Now, this happened at campus levels?

36-00:13:58

King:

One way or another, yeah. What this did was to give us a way to build a budget for it. Build state money budget. So back to the partnership and compact. The way that worked was there was the guaranteed level of funding, which you hoped you would get, and then there were initiatives beyond that guaranteed level of funding and very, very frequently elements of this Industry–University Cooperative Research Program would be initiatives. And that is how we got more state money for specific subject areas. We started with biotechnology, then brought on information, energy, nano, et cetera. I think there are five components to the program as it is or was. So we were able to get state money specifically for this purpose, making a point that Dick very much wanted to drive home with the state, which was the value of university research to the economy of California. So this was a very direct example of it. And as head of this we put Susanne Huttner, who was a huge driver of things. She was very much one for getting something done.

36-00:15:28

Rubens:

Where had she come from?

36-00:15:31

King:

She had been at Santa Barbara and had been the head of the biotech MRU. So she was homegrown. And as I say, a very hard-driving

individual, sometimes rubbing people the wrong way. But Dick saw her as somebody to get things done and so she was. So she set up and designed this. And we set up a mechanism for how proposals were made, grants were made, et cetera, and I'll talk about that. But she also put another component into it, which was to have some research on the ways in which UC research built the economy so we could have more specific figures. And out of that latter came the best job I have ever seen of documenting UC's role with regard to both the biotech industry and the electronics industry. It's more specific on the biotech industry. But many times I have wanted to give a talk in which I have a punchy illustration of very tangible ways in which the university's research has built the economy. And I use the stuff that she came up with in that program and, as well, the example of the wine industry, which is another one where UC just enabled it all the way.

36-00:17:13

Rubens:

And then I guess historically the ag industry.

36-00:17:15

King:

And historically the ag industry, yes.

36-00:17:18

Rubens:

And forestry.

36-00:17:20

King:

So now back to the program. So the idea was to be able to do quite large projects that would involve both industry and university, which could be funded multiple years, which would be peer reviewed for their selection, and then to build the budget, the state budget for their portion of that by budget initiatives. That sold very well in Sacramento. So that was the game and it built up to quite a large budgetary level. Interestingly enough, I tried to find that [the total dollar value] on the web before our interview today because I knew that would be an important part. I can't find it and I can't find it for a few reasons. One is that, sadly, the program was entirely defunded in the last state budget. It was taken out as one of the budget cuts. And another reason is that the office of the president has considerably changed the website during the last seven years. It used to be a fountain of information on all sorts of things and there is much less there now, unfortunately to my point of view. And also years have passed. But what I did find in looking was that it gave out \$17 million of grants in 2009 and I think they were substantially greater than that in earlier years. It was big money but I don't remember expressly what it was and I don't have a way of finding it.

So it also subsumed what was known as the MICRO Program. MICRO itself is an acronym, but that was an Industry–University Cooperative Research Program developed for the entire UC system by faculty

people working with the semiconductor industry. That's one component.

36-00:19:29

Rubens: This was a university wide?

36-00:19:30

King: Yes. So that was a grant-giving operation, in effect, but I think a very good and very successful one. Another thing that came of that was that we created a very high-level advisory board on industry–university cooperation, where we'd have corporate CEOs, venture capitalists, banking people, et cetera. Life came full circle for me there when the sister of one of my Boy Scouts came onto that board—her name is Kim Polese, and she has been the founder of a number of very successful Silicon Valley firms.

36-00:20:27

Rubens: What would you literally do? You put this into operation?

36-00:20:33

King: We put it into operation. Susanne Huttner reported through the vice provost for research to me. I would meet with her to give her—let us say monthly guidance and oversight. But she very much drove the program herself. But that's a real Dick Atkinson innovation and a very personal stamp on that. It was quite successful.

36-00:21:02

Rubens: Would you attend these advisory board meetings?

36-00:21:05

King: Oh, sure. Yes. The way Dick and I would do things like that is we would sit together and, depending on his druthers, I might very well run the meeting. And I did run the meeting on most of these.

36-00:21:20

Rubens: How often did these meet?

36-00:21:20

King: Three times a year.

36-00:21:24

Rubens: So it's you basically who's picking who these people are?

36-00:21:30

King: Us. Huttner, me, Dick, with—

36-00:21:32

Rubens: And are there some things you'd like to point to particularly that came out of that?

36-00:21:42

King:

Well, I just think there is very good research. There were a huge number of projects. So there's a clear and visible large impact on California. I also believe that the existence and the success of that program had much to do with the story that's coming next, which is the governor's institutes.

36-00:22:23

Rubens:

There must have been some overlap between these companies that were on the advisory board and donations to the university.

36-00:22:40

King:

Well, probably not as much overlap with regard to providing the industrial half of the matching funds for the projects of this program. But clearly there were people on the board who were donors, sure. But that was a more direct route. Just being a loyal graduate or that kind of thing.

36-00:23:01

Rubens:

Is that right? So appointing people to this board was not necessarily cultivating a donor?

36-00:23:09

King:

Not at all. It was to get serious and honest input and attention from them to the program. Just attention was a good thing. And secondarily, it was to create a cadre of people who might be called upon when the university had to present evidence of industry's interest to the university in Sacramento.

36-00:23:39

Rubens:

It sounds like it'll be just great data.

36-00:23:41

King:

And we did some of that.

36-00:23:42

Rubens:

That's terrific. And it's just gone now?

36-00:23:43

King:

Yes. The website says there will be zero funding for 2011–12. I find it hard to imagine that it's going to come back in a future year.

36-00:24:02

Rubens:

Did the policy research program fall under you?

36-00:24:08

King:

Oh, yes, it did. The California Policy Seminar.

36-00:24:12

Rubens:

Should we talk about that?

36-00:24:13

King:

That was Andres Jimenez, although it had originally been John Cummins who founded it. Yes, that did fall under me and that also is gone. But that was an effort to do very specific projects for state government. And quite a few things of very tangible use and very tangible interest to the government went on there. It was interesting that we got organizationally into a question here. Andres sort of liked to run his own program. Steve Arditti was the other person who would have strong interest in having good things done by the university for various legislators, perhaps more on a quid pro quo style. One doesn't know. But Steve did start such an operation within his own office, too. So at a point in time we had the two running in parallel. But the difference of them is that Steve's operation was more in response to immediate specific issue oriented requests. Andres' operation was more where a legislator or a group of legislators would be interested in a systematic broader study of something or other. So his were bigger projects.

36-00:25:47

Rubens:

And then he would find faculty and programs that would feed into that?

36-00:25:50

King:

Yes. He was, in effect, a broker to faculty.

36-00:25:53

Rubens:

Was that something you were particularly interested in?

36-00:25:59

King:

Oh, I met with him monthly, too. It was quite interesting. I liked that program. I think it was good for the university.

36-00:26:41

Redman:

Would you like to get started on the governor's institutes?

36-00:26:46

King:

Yes. Let's get started. We may be able to complete them. As Gray Davis became governor, and his term was '98 to 2003, he of course had already a very close relationship with the university and knew a lot about it because as lieutenant governor he had been a regent. And lieutenant governors do participate in every board of regents meeting. It's one of their biggest duties. So he knew a lot about the university and I think had a lot of respect and positive view of the university. The thing that came to be was that working with his principal scientific advisor, who was Richard Lerner, the president of the Scripps Research Institute at Torrey Pines, La Jolla—working with Richard Lerner and I think in some conversation with Dick Atkinson, came up with the idea of doing something that would leave a very positive legacy in California from the Davis Administration, and in particular

to use the University of California—remember, this is the official research arm of the state—as the mechanism for creating several very large research institutes that would pave the way and help speed the way to new developments that would greatly aid the California economy. So this became an initiative known as the Governor’s Institutes on Science and Innovation. Gray Davis took the idea up enthusiastically from Lerner and decided that the budgetary situation was such that the way he should do this was through capital budget rather than through operating budget.

And so the initiative was started with a definition. It was actually in the governor’s capital budget presented to the legislature that year. That there be three institutes developed which would be funded with a hundred million of capital money, state capital money each, and which would be required to raise at least a two to one match, so two hundred million from other sources for each one, and would be on University of California campuses and administered by the University of California. And it became apparent that this was going to go through the legislature. So with not much notice, the interesting problem here was what definition—what further definition are we going to put on these and how are we going to run some process that decides what these should be, what the subject areas are, and where they should be within the University of California.

36-00:30:26

Redman:

Can I break in and ask what was Gray Davis’s definition of an institute? Was that clear?

36-00:30:43

King:

A large research operation with very close ties to industry and involvement of industry in at least an advisory board of it, but also with this two-to-one match, surely the picture was that industry should believe in what was being done here enough so that they would put in funds of that level. And the idea was to leave a legacy that would do things, and that would build and diversify the economy of California.

36-00:31:20

Redman:

Did Gray Davis speak publicly about this to try to—

36-00:31:22

King:

Oh, yes. And he came to the dedications of most of them. It happened also that my term as chair of the California Council on Science and Technology happened as these institutes were starting. So I can remember a dinner before a CCST meeting at the Sutter Club in Sacramento where Gray Davis is at some other event downstairs and comes into the room and with much display comes up and congratulates CCST on what it is doing and, of course, mentions the institutes as part of what he’s talking about and that I had had a role

with regard to them and that it was me that he was talking to as he came up and did this sort of public thing. The thing that put him onto it was the fact that I had had the role. So yes. He was very interested in these. And I believe they were a very good idea.

So we were left with only the definition that it should be research that was good for the future economy of California. There was nothing with regard to subject area. And the facts that it should be UC and that the money was going to be for big buildings. And, of course, that then left us with a mystery of how to get operating funds that would be required for these institutes. But it turns out that state law enables five percent of capital funds to be used for operation so there was a start. But the interesting thing for me is that this arrived all of a sudden, with not much buildup. And we had to have a defensible process for doing all of this. Defensible within the university, where there would be huge interests in where these were and where the money was and so forth, and defensible outside the university, both to the state government and to the scientific community outside. So that was interesting.

And what happened was that Suzanne Huttner and I sat down and designed a process and I am amazed in hindsight that it worked as well as it did and it had some serendipitous effects that we didn't even have in mind as we were doing the designing. But the process we modeled after NSF centers of the same sort. So we put some definition in the RFP and the definition said that the proposals had to indicate why the field was of importance to the future economy of California, had to demonstrate eventually, as a final proposal, the existence of the two for one match, and then we added two things. One is that it was very desirable for them to be multidisciplinary, to bring in multiple disciplines working together, one discipline with another. And then we also said that it would be an advantage for proposals to have multiple UC campuses involved and they should, by the way, say where they're going to get the operating money.

So we had two rounds on proposals and reviews, preliminary proposals and then final proposals. I think the preliminaries, there may have been something like fifteen of them. And what happened is that Suzanne and I designed to assemble a panel of reviewers who were not UC people, who would be respected within California and by the science community and have them make recommendations with regard to these fifteen preliminary proposals, which then came to, I believe, seven final proposals. We identified seven that we wanted to see go on as final. And then we gave them a whole lot more that they needed to do in their final proposal. All of that traveled maybe six months from the start of the proposal writing process to the ultimate selection.

36-00:36:42

Redman:

That's fast.

36-00:36:43

King:

Very fast. Maybe eight months but nonetheless fast. And in a sense, it was flying to stay just a few steps ahead of the whole game. We were having to do definitions of it as we went along on this. You couldn't give the National Science Foundation book of how to prepare a proposal to these people. We had to write it as we went and nonetheless avoid being ridden out of town on a rail for having done something that everybody thought was terrible. So as I say, it worked remarkably well.

To select among those seven final proposals we put together a still higher level team. Richard Lerner was on it. The secretary of the Nobel Committee was on it and prominent faculty and industrial science engineering leaders from around the state were on it. And they met and their final meeting day turned out to be on the day of a regents meeting. So Dick felt he just absolutely had to go to that meeting of this high powered group and that day is the one day I ever sat at the table of the regents in lieu of the president. So the recommendation of this group was that here are the three winners and the reasons for it and, by the way, we believe that a fourth one is so strong and so critically important that we believe there should be funding for that, too. And that fourth one, which we'll get to, required a new budget proposal by the governor that did in fact go through. So there are four of these institutes. The first three are Cal IT2, which is the California Institute for Telecommunications and Information Technologies. That is San Diego and Irvine, and it has had Larry Smarr as the director of it all the way. He is the former head of the super computer center at the University of Illinois and he has been a dynamo. He was really impressive in my day. The second one of these was QB3, which stood for Quantitative Biotechnology, bio-something else and bio-something else but calls itself now by a different name.

36-00:39:44

Redman:

Now it's California Institute for the Quantitative Biosciences. But it's still QB3.

36-00:39:50

King:

The original name on the proposal had three things that began with bio and therefore the name QB3, which is still the short name for them. That one is San Francisco, Berkeley, Santa Cruz. All of these have resulted in substantial buildings at their locations. At Berkeley, the building is Stanley Hall, the new Stanley Hall. At UCSF it's a part of an add-on to the Genentech Hall, which is an original Mission Bay building. Third one of these is the California Nanotechnology Institute, which is UCLA and Santa Barbara. And the fourth one, which is the



one that got a special recommendation to come into the existence and was the additional budget initiative, is CITRIS, the California Institute of Technology Research in the Interest of Society.

So these all came into being as very large operations. Our role was really over then because even though the NSF, for one of its centers would have periodic reviews and continuation considerations and possible endings of their institutes, the state money in these was the building and the building is in Irvine or in Berkeley or in San Francisco and you're not going to pick it up and move it somewhere. So it's pretty much permanent locations for these things. And from an administrative point of view, that was a very interesting question and very vexing to Susanne and me, and that is just where are the handles with regard to assuring that quality develops and persists at these places. So anyhow, here they are.

Oh, and CITRIS I didn't give the campuses on. That's an interesting one. That's Berkeley and also Davis and Santa Cruz and Merced. And the multi-disciplinarity in CITRIS is the mixing of hard and soft science or natural sciences and social sciences, which is difficult and maybe has yet to succeed fully in CITRIS but is something I believe much needs to happen within the university. And my [own] two steps in that direction are the school of information, which we discussed, and CITRIS.

So I do think the existence of IUCRP was vital to that program happening. And then there's another step from there forward, if we've got a few minutes still, and that is that I believe that the existence of one of those institutes was crucial for the University of California Berkeley team landing the Energy Bio-sciences Institute from British Petroleum some years later because a large multidisciplinary unit with support staff of all sorts existed there at QB3 here in Berkeley to put that proposal together in what was a very short period of time also. And I don't think it could have happened to that quality starting de novo. The start was very important.

36-00:44:22

Redman:

I do have to ask. You've talked throughout your entire time at Berkeley about university-industry relationships. So can you verbalize what these governor's institutes brought to the campus that was different?

36-00:44:

King:

Well, my goodness. Hundreds of millions of dollars of industrial support for UC research. Now, to go back on that two-to-one match. The way it happened was through industry funds for three of them, through federal funds for the fourth. The nano one is federal funds.

There isn't a big nano industry with lots of profits. But the other three, it was industrial funds. There's a brilliance to that, a serendipitous brilliance, which I should mention. The fact that we left the fields utterly unidentified and the proposals had to put forward what the fields would be. The reason we did that was that we thought that would strengthen the proposals, that they would have to make the entire case and not have sort of a predetermined captive field. But there is another grand thing that came from that, which is that more than four areas of industry were in this competition. And therefore, industrial companies, in order to have one of these things in their area, in their subject area and geographical area, had to make it happen. It had to be chosen in the competition. That's the serendipitous one, because that brought in a lot of industrial money that came for the reason of wanting to have the institute appear in their field in the first place.

36-00:46:27

Rubens:

Was it hard to get those four? The remaining three, were they pretty good?

36-00:46:35

King:

It was pretty hard to draw a clear dividing line here. Remember, I didn't do this, Susanne didn't do it. The high level review committee did it. And they did it both with their own judgment and with a lot of written peer reviews that had been solicited by Susanne from other people to feed into that operation. So in that sense, it worked like an NIH review panel. So sure, there's never a crystal sharp line. There was the unfortunate feature of this, that there's only one campus at which there isn't one of these, Riverside—it was the agricultural areas that were among those that didn't get it. But nonetheless, there had to be a certain number of institutes, there had to be a process. Peer review and competition are great honers of quality. There have to be losers.

36-00:48:03

Redman:

So you were just talking about these industries that were very interested in having these partnerships. And, again, could you describe what these industries were getting out of this relationship? There was clearly enough to be putting a lot of money into it.

36-00:48:21

King:

They get a base of research results and leads from research that they can then take and run with. And then, to go deeper than that, we have to divide one area from another because the rest of the story is different depending on what industry it is. If it is the electronics or information technology industry, like Cal IT2 or CITRIS, there is not much interest in patents. The research can be open. It doesn't matter that your competitor knows the research results, too, and there's no complication. Biotech, of course, is different and there are enormous

upfront investments to bring something to market and they do want ownership, so there is more of an ownership issue with the biotech industry.

Now, to support research within these institutes, we have the same policy that goes for UC technology transfer and patenting in general, which is that it is possible for a company to support a research project and have first right of refusal on an exclusive license on the output. So they have first right of refusal. What that means is they can, if they wish, be the first corporation with which the university negotiates for a license. And if the university believes that the proposed licensing terms are reasonable and advantageous to the university, then it can just go ahead and license to that company without having to approach ten other companies. That's an advantage in the bio-tech area where patents are so important. But generally, particularly in these other more electronics areas, it's considered very desirable by the entire industry to have a whole lot of new research results out there to get new ideas and things to run with.

36-00:50:33  
Redman:

This might not fall under anything that you were involved with but how did these institutes attract faculty? I assume that there are students that work in these, as well.

36-00:50:48  
King:

Certainly the institutes were a good recruitment mechanism for the campuses that had them. So there are faculty members—a number of them—who have been brought here because the institute is here and it's attractive to them and you see value to having them, heavily so. Yes, it was a good recruitment tool. It's a good recruitment tool for students and it's a very effective way of assuring good research progress in these areas, again because they're multidisciplinary. It's not going to work as well as if there's a chemist here and an economist there and an engineer here working on it. To bring them together with labs next to each other, all in the same building, et cetera, is a very desirable thing. So that really helps bring the different disciplines together because they're not going to find each other and interact as well if they're all in different buildings of their own discipline. So that's just the physical concentration of people. And then the provision of what may be very large-scale service facilities or service instruments for research in the area, that's another thing one of these institutes can do. An avenue to industry because here are all these industrial partners that have provided money to the institute. So for the researcher, that's attractive. Very direct paths for contact with whatever in industry. And since researchers don't know what their next good idea is going to be, it's very good to have a whole spectrum of possibilities out there of contacts and co-workers.

36-00:52:42

Redman:

And do the UC campuses fund any of these in any way?

36-00:52:47

King:

Well, there's the issue of the operating costs. That arose early on and was difficult and was the subject of quite a few council of chancellors meetings. The amount derivable from the original capital funds was small. So there had to be a way of getting greater operating costs, and how to do it. What eventually happened is that campuses, the individual campuses, made deals with the institutes and the deal, a typical deal, would be to define the incremental research funding that had come in because the institute was there and then identify the overhead return to the campus that accompanied those grants and then make an agreement as to what percentage of that overhead would go directly to the institute for operating funds rather than as chancellors discretionary funds. That was the most common solution to the operating dollar problem. There was both a time and a size element to the operating dollar problem. The time was that the money from the five percent of the capital money could only be used for the first five years. The size was that it wasn't enough, even that amount, for those five years. So that was one difficulty. Another comment on those is that there are other states that tried to do the same things. This got so much fame and notoriety around the country that it wasn't much later that the State of New York decided to build five such institutes and they made one great difference in the way they did it and that is that it was non-competitive. They simply picked the subject areas and the places they would be and that was it and that's not good because the competition and what you have to do associated with the competition is what drives your energy and your thought process and, as I said, hones quality. So you don't get as good an institute that way.

36-00:55:21

Rubens:

So did the administration of all this fall under you?

36-00:55:27

King:

Yes.

36-00:55:30

Rubens:

And so when you said the whole issue of review, of really evaluating what you're getting, did you have to set up a mechanism for that?

36-00:55:41

King:

Well, we did but the senate also wanted to review them. So I believe the senate does review these in the same way they review the ORUs and MRUs. So that's two kinds of review. But yes, we did set something up. It would not surprise me if it's no longer reviewed at the system level. The problem from an administrator's point of view who wants to do quality assurance is that you don't really have a handle

here. What is it that you're going to do if they don't look good? Burn down the building?

36-00:56:26

Redman:

I have just one final question. One of the stated goals of these institutes is to improve the quality of life for all Californians. That seems like a bold claim.

36-00:56:37

King:

Yes.

36-00:56:39

Redman:

Could you briefly explain what is meant by that and whether you think that these institutes have accomplished this or will accomplish this.

36-00:56:48

King:

How do you like your successive generations of smartphone? Because that is the subject of Cal IT2. So what one has to do is to look at the inventions and developments that have come from that, that have come from QB3 on either side of the Bay and tally them up. They're most certainly there. And I know this because I remain on the email list for everything from QB3 San Francisco where Reg Kelly, a former executive vice chancellor of UCSF is the director of QB3 there. There are all kinds of events with all kinds of things on the program, and reporting of the adoption of something from QB3 into industry. It is happening. And one could take a Susanne Huttner and gather that information together and probably make a very wonderful ten-page booklet that would be useful in Sacramento and it wouldn't surprise me in the least if that booklet already exists. [laughter]

36-00:58:08

Rubens:

Is the Blum Center a separate building?

36-00:58:11

King:

It's different. It's a huge ORU is what it is. It's not part of either CITRIS or QB3. It's in the category—and this is something we could put on the list for the future. It's in the category of being one of the official multidisciplinary initiatives of the Berkeley campus.

36-00:58:35

Rubens:

All right. So let's do that.

36-00:58:36

King:

I did a study project on those multidisciplinary initiatives that started in 2007, I did that for George Breslauer in his first year as executive vice chancellor and got it three-quarters finished.

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Audio File 37

37-00:04:35

Rubens: I would like to clarify something in the structure of the office of the president. There are eight vice presidents.

37-00:05:17

King: Yes. The other senior vice president back then was the business person and if you say 2000/2001 I have to think that was when Kennedy left and when Mullenix came.

37-00:05:45

Rubens: And then there's another senior vice president for university and external relations.

37-00:05:49

King: Yes. And that subsequently got made university relations and that's occupied by Bruce Darling at that time. And then a number of other vice presidents. Agriculture, health sciences, hospitals by whatever name.

37-00:06:10

Rubens: Health affairs at this time, clinical services. And then there's laboratory management.

37-00:06:20

King: Well, again, I have to think of the year but I think laboratory management became a vice presidency during my time there. That would be a good way to start things off when we talk about the labs: what existed before I got there, what changed and happened as I got there and where it went while I was there.

37-00:06:52

Rubens: So let's talk about the whole budgetary process and it's very complicated and you were critical to it. Larry Hershman says in his oral history that there were constant—

37-00:07:13

King: Yes, he used to say I was the one person who read it. [laughter] So as we get into the process, we'll get to where I would have read it and what I did.

37-00:07:25

Rubens: Where would you like to start with this then?

37-00:07:28

King: Well, maybe the type of budget the university has. First of all it has one budget and that's very important that there be one budget floating

around in Sacramento and not ten budgets for ten individual campuses. That keeps things focused. And there is an annual budget process for the state. The university, for better or for worse, has always worked by incremental or evolutionary budgeting. That is, they don't sunset. There isn't a question that has to be addressed on everything each year as to why it exists at all. The questions are what will be the changes, not whether it's there. And so therefore the university's process in terms of putting things together would begin in the summer of a year for the budget that's going to be the following fiscal year. So the process would begin in June, July and August, let's say, of 2001 for a budget that would be blessed by the regents—and then the governor and then the legislature—in the fall of 2001 and would be intended for the year 2002-03.

So the facts of how it worked are this. It gets put together during the summer as a proposed budget. It goes to the regents. It used to go [to them] once. Then during my time it shifted to where it would go two successive regents meetings and typically September for a first discussion of the budget and then November for an adoption of the budget by the regents. That adopted budget then becomes what's known as the regents budget. And it's represented in a couple of paperbound booklets each year. I have them for one set of years that I brought with me. And the regents will have a discussion of why the budget is what size it is and may make changes in the budget. So then once that budget is passed by the regents it goes into the governor's office and the department of finance, and it, along with everything else that has been prepared by every other entity covered in the California state budget gets ground away on and next appears about January 10th as the governor's budget. The governor makes a budgetary presentation to the legislature and releases his budget. Then that budget proposed by the governor goes to the legislature. The legislature bats it around and we are supposed by law to have a budget passed by June 15th, which will then be the year that starts the July 1 immediately following that June 15th and extends for twelve months. So that's sort of the milestones of it.

Now, the issues are how it gets put together and what input goes into it. There has always been concern among chancellors and academic vice chancellors and others on campuses that they just didn't see a way of having input into the budget and when did it happen and it was all mysterious and a rather closed process. So that's something I tried to deal with a lot during my time there and I want to come back to that after I describe how the process goes through. So the budget office at the office of the president would prepare a draft of this regent's budget document, two volumes, one for operations, one for capital, and they would be doing that during the summer. That would come to a whole lot of people around the office of the president to look at. I tended to

read it all and comment wherever I thought appropriate. So they got a lot of comments from me. Not everybody did that. Everybody has a full job of one kind or another and the budget documents are large and so it's not easy to wade through them and do them.

37-00:12:22

Rubens:

This was your nature? Your administrative skill that led you to do this?

37-00:12:18

King:

Plus the importance of the issue, which I'm going to get back to. So there was a point of particular people at the office of the president having input and I believe that material was put to campuses to look at, whether they got the entire document or whether different people on campuses got different pieces of it I'm not sure. Then as the regents took it up there would be discussion, public discussion at the regents meeting. Nearly always there was some very controversial issue that could be attached to the budget and so it would be a big issue for the public comment period, whatever the subject was, and the regents would have substantial discussion of whatever parts of it they chose to bring up and have discussion about. Then the interesting thing was once the regents passed that budget you went into a period of very limited communication in between that regents meeting, which would be the November regents meeting, say something like the 17th of November. Between then and January 10th it was a closed process. The governor's office is making up its budget. Certain people were privy to that process. One was Larry Hershman, the vice president for the budget, and the president would get some more limited but substantial knowledge of the process as it was going on. The rest of us did not and it was operated as if it was a closed group of people. That is, the people who were in on what was going on in the department of finance were in effect sworn to secrecy and could not talk to others so there would not be leaks about the governor's budget until the governor's office chose to leak parts of it in early January. So that was a very difficult and critical period because negotiations would be going on all the time and you would know very little, next to nothing, about what they were and things could get into the budget that might be difficult and where people could have had strong feelings. An example that actually went in before my time was that the faculty should teach a certain number of courses per year and that got put into the budget language as an agreement by the university. Then we had annual occasions seeing if we were teaching the right number of courses per year and that put a perturbation on things. That particular one led to a profusion of one-unit courses so that the campuses would be teaching the requisite number per year. And so we at one point had to go address that problem.



So the important thing is that was sort of a closed process. And then once the governor gives his budget it becomes a matter of all the machinations within the legislature by legislative staff. There are budgetary hearings. The president will go to at least one of these. Others will go to others. I went to some of them. The budgetary hearings weren't so much going over the budget item by item. They would be particular issues singled out by legislators who wanted to discuss them. And so, for example, last time we had a lot of discussion about accountability in the outreach activities of the university. I spent a budget session up in Sacramento with Cruz Bustamante in the room with the legislative committee, I think I mentioned this, where there was intense interest in the accountability for outreach. Well, the budget hearing was just the occasion for this.

So the problem as I saw it was that we needed to have a way for the academic enterprise of the university, which is what I was responsible for, to have meaningful, good and timely input into the budget process. The academic vice chancellors tended to have a feeling that they were playing catch-up. There would be things that would pop out of this closed operation from mid-November to early January when the governor's budget was, things that would pop out and surprise them. They would wish to have known about them in advance and yet, of course, that period was a period of people not being able to talk.

So how to remedy all of this and how to make it work better? Actually, before I got there, one step had been taken and that was the executive budget committee, which is on that chart we were looking at a few times ago.

It's purple [on that chart] because it was joint senate and administration. It was a group of some chancellors appointed by the president, various vice presidents, one or two academic vice chancellors, one or two campus business or budget people put together to discuss budgetary issues.

37-00:17:58

Rubens:

Appointed by the president through you, as well?

37-00:18:01

King:

No. Well, I was on it. But the members were appointed by the president.

37-00:18:06

Rubens:

Not in consultation.

37-00:18:07

King:

Well, it was known it would be a certain number of chancellors and big campus, little campus, that kind of thing. So that was one effort to

try to get general discussion of budgetary needs to in effect equip Larry Hershman when he would go into both the development of the budget over the summer and then the period of negotiation with the governor's office and the department of finance between November and January. This still, of course, was not satisfactory to all chancellors or all vice chancellors so with the council of vice chancellors, which in those days met monthly, I reached an understanding that we would have two sessions a year when we would spend hours on the budget. These were day-long meetings. So we would spend at least two hours, sometimes more, on budgetary matters and try to do this at the right times of year so that Larry Hershman, who would be part of those discussions, would be equipped with all the thinking and so that I would, too, and then that would put me in a position when I reviewed the budget and the draft budget in late summer to be able to catch things that I knew could be important or critical issues. And it would put Larry in a situation of having guidance with regard to what went on during those critical almost two months of the silent period as the governor develops his budget. So those were things we tried to do.

I think, backing off from all of this, those were days—what we came up with, the executive budget committee in those lengthy sessions at COVC were certainly helpful towards what we were trying to accomplish but they did not solve the problem. There was still an issue of a budget process that left critical people on the campuses, important people on the campuses, feeling they hadn't been properly taken into account or things bounced off of them or whatever. It's interesting. Compare this with corporate budget processes. I've run into a number of those one way or another over the years and in many corporations there is a bottom-up budgetary process where the sections develop their budgets, their proposed budgets by such and such a date. Those budgets are received by the departments who create on a larger scale their departmental budget by a certain date and then this goes forward in a very well defined and quite systematic enterprise. That we didn't really do. And, of course, part of the reason we couldn't do that is the fact that this is a state budget that we're interfacing with. And the regents budget has no standing other than what amount of it ends up appearing in the governor's budget. The regents budget doesn't go to the legislature, the governor's budget goes to the legislature. So in that sense there wasn't as solid and systematic a bottom-up budget process as there is in many corporations. Now, I'm sure that department chairs and deans would feel that there is a lot of hard labor associated with doing a bottom-up budget process and that then would be something to address in the university.

But the fact of the matter is that many of the vice chancellors and other people on campuses, would tend to look at Larry as being rather

authoritarian. I think the process was a lot of the reason for it, particularly that mute period of almost two months there before the governor's budget came out. I think that was a lot of the reason. And then Larry had a very thorough understanding of everything having to do with the budget in Sacramento and would speak quite assertively about that. "You can do this. You cannot do that." Definitive statements. And I think there may have been some aspects of manner that were bothersome to various of the campus people on that. My read on Larry from these nine years of interacting with him so heavily on the budget was that he had a thorough understanding. He did try to respond to what came up from the ranks by our various mechanisms. He did use the executive budget committee heavily to develop the initiatives that we would put into the partnership budgets. We discussed that at one point but I think maybe I ought to spend a little more time on that. We had these partnerships and contracts—compacts, it was, and I've forgotten which name went which way. But if it was a partnership with a governor of one party then it was a compact when the governor came from the other party. So we had those and they were intended to be minima on the budget—a guaranteed minimum. And then the university would submit things for additional funding. And I mentioned that a lot of what we put in in the way of new multidisciplinary research activities or centers would come in as those proposed initiatives, above and beyond the compact budget. And a lot of process, both at COVC and with the executive budget committee, went into selecting the particular initiatives. So there was good involvement of people there.

I also think that Larry was very skilled at the dealings in Sacramento and that certainly the nature and qualities of Larry Hershman had a lot to do with us doing as well as we did in the budget process during those years. Because there was some tough years for the state there and yet we always came out pretty well.

37-00:25:02

Rubens:

Is this all right to ask a few questions now? I didn't want to interrupt your train of thought.

37-00:25:06

King:

That's fine.

37-00:25:17

Rubens:

Did Hershman not inform you or anyone else of what was being discussed in that mute period?

37-00:25:27

King:

He couldn't discuss it with me. That was the rules of the game as I understood them. It wasn't his choice, it was—

37-00:25:34  
Rubens: But did he follow those rules?

37-00:25:35  
King: It's the rules of the governor's office and the department of finance.

37-00:25:38  
Rubens: I understand that but it's not a public leak. Would there be no working discussion?

37-00:25:49  
King: The question is how wide is the circle that the governor's office allows.

37-00:25:54  
Rubens: I'm asking about informal perhaps extralegal—

37-00:25:59  
King: Yes, there would be some things sounded out on me, or brought up with me in conversation.

37-00:26:05  
Rubens: There had to have been.

37-00:26:05  
King: But I always felt I did not know much about what would come out in the governor's budget.

37-00:26:11  
Rubens: Okay. What if something was particularly thorny or there was a question of how do we get around this or have we lost something?

37-00:26:17  
King: That would occasionally happen but it would come in the form of a conversation on whatever that thorny subject was rather than being prefaced by, "Well, today in the negotiations over the budget, we were offered this in return for that." That kind of thing never happened.

37-00:26:34  
Rubens: It didn't? Really?

37-00:26:38  
King: But discussion of subjects, sure.

37-00:26:39  
Rubens: And Steve?

37-00:26:42  
King: Steve was certainly involved in the process but Larry took the primary lead in Sacramento in the development of the budget and I guess the way to look at it is this. That Steve's office dealt mostly with the legislature. Larry, in the development of the budget, was dealing with

an arm of the executive branch, the department of finance. And so Steve very rarely got involved with the executive arm. It was nearly always the legislature and that was the division. So in that sense, Larry had the whole negotiation on the budget with the department of finance and the governor's office up until the governor's budget came out and then it was as it started getting into the legislature and getting batted around there that Steve would have his role.

37-00:27:38

Rubens:

One of the scuttlebutts about Hershman is that we he didn't write down a lot. That he had so much in his brain that that led to—the style led to a certain vision of him being secretive or not allowing for a more participatory budget process.

37-00:28:01

King:

Yes. Well, I think that point is well taken. That there were a lot of organizational things that could have been done more thoroughly. And that actually became a point of concern at one point. I'm trying to remember exactly when it was. It was early in my time in office but it was during my time in office as provost that a decision was made that Larry should have a second in command who would be systematic and organized and make sure that this was done before that, et cetera. Larry's strong point was the negotiations with the state so the idea was to be complementary to that and have somebody whose strong point would be the internals of the budget office and the workings and making sure the bases were touched in the right way and things were recorded. That position went to Jerry Kissler, who was there most of my years in that position as the second in command of the budget office.

Let me bring up another aspect of this, too. Because particularly before Kissler was there, things would start boiling away in the budget office and I discovered rather early on that I wasn't finding out about them as soon as I wanted to or needed to because it would just be a matter of when I had my next meeting with Larry and did we remember to discuss that subject. So I actually did something within my own organization. Sandy Smith, who headed what was known as the office of planning and analysis, was a person who had had a lot of involvement with the budget process in the past and knew how things worked in the budget office. So I had this understanding with Sandy that a big part of her job was to keep tabs on the budget office and what is happening and determine if there is something I need to be discussing or should be discussing with Larry that hasn't yet come on to the table, to let me know. That was a very important part of Sandy's role and that was another thing I did to try to keep up with this fast moving, not ultra-systematic process.

37-00:30:34

Rubens:

How often would you meet with Larry? Obviously it would be more during these particular milestones.

37-00:30:39

King:

Yes. We would meet at least monthly and then the other way the office of the—individual meetings with him monthly or more often. But the way the office of the president worked, there were also meetings of the president's cabinet on Monday morning, a meeting of the vice presidents with the president, a meeting of another group whose name I've forgotten which was just certain vice presidents, which was me and Wayne Kennedy or Joe Mullinix and Bruce Darling and Larry with the president. That had a name, that group, and it's not coming to me at the moment. But in any event, so there were these assorted types of group meetings that would be other opportunities. And then, of course, the executive budget committee would meet monthly and that would be Larry and me and the others. So there were lots of opportunities for interchange but the important thing was to know when something was a-brew, because the thing that didn't happen was any kind of systematic notification of what is the new issue that's just arrived on scene. That's why I had Sandy as my eyes and ears.

37-00:31:58

Rubens:

She worked pretty well with Hershman.

37-00:32:01

King:

Oh, yes. And with his people. And she would also be plugged into those under Hershman, like Debbie Obley.

37-00:32:07

Rubens:

And what about Hershman and Atkinson? Is there anything specifically to say? Firstly, did he meet individually with Atkinson?

37-00:32:15

King:

He reported to Atkinson. That actually was a change made during my time there because under Peltason Larry reported to Walter Massey and so I came in, my first seven weeks, six weeks, were under Peltason rather than under Atkinson, who came in October 1st of that year. So I had Larry actually reporting to me during those six weeks. And then Dick, just a week or so before he started at OP, called me one day and said, "Jud, I have made a decision and I want to tell you this and have to tell you this, and that is that I want the budget VP reporting directly to me." That's when the change was made.

37-00:33:02

Rubens:

This is important. How involved was Atkinson in the final budget? He wanted to have a good strong overview of it and—

37-00:33:19

King:

Well, he certainly cared about the budget and I believe Dick felt it was probably a very visible and exceedingly important thing each year—the budget and how it came out—and so he cared greatly about the process of negotiation with the state, the governor and others that would have a lot to do with whether there was a good budget or a not so good budget or an even better budget. So Dick cared greatly about that. I don't have a read on the level of detail to which Dick got in his discussions with Larry. I suspect that he left a lot of autonomy to Larry.

37-00:34:07

Rubens:

But he wanted the vice president of budget to be reporting to him? That was something that's a representation of how involved he—or how important he thought it was.

37-00:34:19

King:

I think so. Dick also had his initiatives and his new things that he was trying to create and there may also have been an element of wanting to be able to deal directly with the budget person on those rather than first having to get a bunch of other vice presidents or chancellors or whatever onboard for whatever it was.

37-00:34:42

Rubens:

I thought you gave such a clear explanation about the different models of the budgetary process—that this was not particularly one that came from the bottom up. And is it obvious what the advantage was to the system? Time consuming, also to maintain more control.

37-00:35:04

King:

Well, one advantage of the system of the way the budget process was, was that it was agile and could respond quickly and I think Larry probably valued that aspect of it considerably. In these very systematic, bottom-up budget processes, it's more about process than flexibility.

37-00:35:30

Rubens:

And you're dealing with so many entities. With the legislature, the governor. You mentioned that some of the campuses felt their nose a bit out of joint. But beyond the chancellors of the campuses, who would be the entities that felt left out?

37-00:35:51

King:

Well, the academic vice chancellors definitely tended to have that feeling and that was the reason I went to these two in-depth sessions per year between Larry and the vice chancellors. The vice chancellors would tend to meet and talk among themselves and so the way we did most COVC meetings, they might get there at three o'clock. I would get there at four o'clock on the first afternoon. Then there's going to

be a full day meeting the next day with an agenda and there's a dinner the night in between, a very pleasant dinner. But the first afternoon was used for them getting together among themselves and then bringing up whatever they wanted to bring up with just me. And this was probably the most frequent thing that they brought up with just me, was their wanting more involvement, somehow, some way, in the budget process.

37-00:37:00

Rubens:

And not to go through their chancellor. They wanted to have a direct access.

37-00:37:06

King:

Many of them were the budget person for their campus. So I don't think it's a matter of avoiding the chancellor or trying to get something in that wouldn't have come through the chancellor. It's a matter of the oversight of the budget being a significant part of their job. That's something that was very different from campus to campus and it's been different on the Berkeley campus. To whom does the budget person report? And the answer is sometimes the chancellor, the answer is sometimes the executive vice chancellor or provost. And at Berkeley, for the Heyman administration, it was both. Errol Mauchlan had a dual reporting relationship to Mike and to Rod.

37-00:38:26

Rubens:

Well, should we say anything specifically about then the next phase, the legislative phase?

37-00:38:39

King:

Yes. So you'd get the governor's budget and it would have whatever it had in it for the university. In later years, as the state budget became bad enough so that the governor was not able even to deliver the minimum there was a lot of discussion within the university as to whether the amount of money identified in the compact or partnership was a minimum or a maximum and there were those who felt that the existence of the partnerships put a maximum on what we could get that was an artificial maximum. I believe it was treated as a minimum and it's just the fact that Sacramento was running out of money and couldn't meet their obligations that would lead to our not getting the minimum. Now, the question you asked me was what, again?

37-00:39:41

Rubens:

Well, really what I was trying to get at was the extent to which you were involved in monitoring the legislative process?

37-00:39:49

King:

Yes, all right. So in some years I would go up there and testify as part of the budget hearings. But again, there is the matter that the hearings would treat isolated subjects. It wasn't a matter of the university has



asked for this many million for this, this many million for that and so forth. It was a matter of particular isolated subjects that appeared somewhere within the budget being of interest to the legislature. There would be a hearing at which the president went and delivered his statement with regard to the budget.

37-00:40:30

Rubens:

And he wrote that in his office?

37-00:40:33

King:

And so would Charlie Reed for CSU, so would the community college person.

37-00:40:40

Rubens:

And that statement was architected between Hershman and Atkinson?

37-00:40:44

King:

Probably had its facts from Hershman and a draft from Hershman and a redo by Pat Pelfrey. So it's not what you might think, that there's a systematic examination of each item in the budget. It's instead whatever is the issue of the day. And so the year the issue was outreach I went for a three hour budget session. If the issue was something in somebody else's purview, that person would go. So I did have involvement in hearings. We always had a way of preparing people for these hearings, so that you would go up about two hours early and there would be a lunch. If this was an afternoon hearing there'd be a lunch in Steve Arditti's office around the big conference table and you would get groomed for what's important, think of this, remember that, here's a key piece of information, et cetera. There would also be a briefing book prepared often that you would take up and try to pack into your mind as you were going up and have it all there so that you could draw on it.

With regard to the budget, the state process involves the legislature. They used to have to pass the budget by a two-thirds vote. Now it's only tax increases taking two-third and the budget itself takes a majority. But in those days it required a two-thirds vote. So very typically the two houses of the legislature would not have passed the budget because of the difficulty of getting the two-thirds vote and it then comes down to what's called the big five. The big five are the governor and then the two leaders of each house of the legislature, one per party. And those five then negotiate out the final end. Very often pieces of the UC budget and ones in my purview were right there at the very end being kicked around. That nearly always happened to outreach. It was held as a trading card by the Republicans because they knew the Democrats would want it. So as the budget is coming up to the end and the June 15th deadline has gone by and it's August and September, even, it was once, before the budget is passed—it's very

difficult for people whose jobs are depending on what the big five are going to do there at the end. And that would create tense times.

37-00:43:45

Rubens: And so is Steve Arditti coming back and talking to you and Atkinson?

37-00:43:50

King: Yes. He would either come down to Oakland or many phone calls, conference calls.

37-00:43:58

Rubens: Are there any other issues? You've mentioned outreach. Are there any that are outstanding in your mind that might have caused particular anxiety or required you to testify?

37-00:44:11

King: Well, I think we probably did it. I was probably up there once on admissions per se too.

37-00:44:14

Rubens: Right. And what about the compensation packages? Did that happen under you?

37-00:44:24

King: The Gardner compensation package was at the end of the Gardner administration. The next round in 2005, 2006, that's after me. Because one of the things that triggered it was the moving allowance for my successor.

37-00:44:45

Rubens: This is a minor question. But you have these basically two day planning sessions. How did this decision come that there should be a dinner? Is it a nicety? Is it a sense that in a more informal situation good feelings are likely to be fostered?

37-00:45:17

King: Both. Everybody's there in Santa Barbara, if it's Santa Barbara, and you all have to eat dinner so of course you're going to have dinner together. But it is also a setting just to get to know one another and not be fencing around about a particular issue. So I came to know all of the campus provosts or executive vice chancellors, or I think San Diego was an academic vice chancellor. I came to know all of them quite well.

I may have described this in the past but I always felt that was the problem solving body. You would go to the council of chancellors and chancellors who have a lot of pressure and a lot of very difficult issues and are sitting right there under the gun. It's a good opportunity for them to blow off steam and so they blow off steam and so you got to decide that this and that and the other thing are wrong. And then you

need to say, well, somebody's going to fix it. So now the problem is you've got ten chancellors and the president and the provost sitting there, so the person who's going to fix it is the provost always. So I caught that ball often. But the council of vice chancellors was not particularly a blow-off-steam group. It's a how can we fix it [group]. What is the potential solution? How can we get there, that kind of discussion. So it was a much more reasoned, non-emotional discussion.

37-00:46:57 [group]

Rubens:

Well, I would think, Jud, also, that your particular gift, your style of leadership that was so unflappable, that was so calm also had an influence on the process.

37-00:47:10

King:

I think that was important, yes, and I think that is a place where my particular way of going at things worked well. I don't think I was perceived as threatening by them. I was not perceived as autocratic and I certainly did listen. And I would try to do things that would help fix things—yes, I'm a fixer, too. We engineers do that, you know.

37-00:47:38

Rubens:

When you talked about balls that you had to catch that came out of some of these chancellor meetings, is there anything that you particularly remember that we haven't identified? I know that, of course, admissions and money and outreach would be examples, as well as the placement of the initiative.

37-00:48:05

King:

The issues were so different from meeting to meeting. It was a large number of things. I don't think any one of them particularly stands out more than the others. But just as a small example of the type of thing. There is the UCUES-SERU [University of California Undergraduate Experience Survey; Student Experience in the Research University] project that's done actually through the Center for Studies in Higher Education here and was being done through the Center back when I was provost. There was concern about that within the council of chancellors because it would survey students on individual campuses and the students would say whatever they had to say about their experiences as undergraduates on the campuses and you could compare the campuses, which means somebody would be at the top and somebody would be at the bottom with regard to whatever it was that the students were being interviewed on. I do remember one occasion when a whole lot of concerns were expressed about that and the idea was that I should go somehow work with UCUES so that only proper comparisons were made rather than improper comparisons. And, of course, there was no way to define what's proper and what's improper. [laughter]

37-00:49:30

Rubens: What is that distinction.

37-00:49:37

King: Then on other occasions it would just depend on what was the issue of the day and what were people worked up about.

37-00:49:44

Rubens: What was the other program? I know the UCUES but I don't think I know the other one. SERU?

37-00:49:49

King: This is very complicated. UCUES is the University of California undergraduate experience survey. SERU is a wider operation that includes UCUES but also includes nine other AAU universities who are part of it and SERU is student experience in the research university.

37-00:50:39

King: I think where we would go from here is how the office of the president works and are there better ways for it to work and what is the interface between the office of the president and the campuses. We're going to pick that up in general later on. Should we make the transition now to talk about the labs?

37-00:50:59

King: By all means.

37-00:51:11

Redman: You had mentioned earlier that you had wanted to introduce the labs. Is that still the case or would you like me to?

37-00:51:21

King: No, I'd be glad to. I think the particular things that happened with regard to the national labs during my time have to be viewed in the overall context because it's just a nine and a half year snapshot during my period. The reason the University of California manages these three national laboratories is well couched in history and is very specific history. We manage Los Alamos and Livermore because Robert Oppenheimer was a University of California Berkeley professor and Ernest O. Lawrence was very influential in the US government and was both a Berkeley professor and had his own laboratory up the hill. So it's because of that that the university came into it. The government from the beginning wanted to make sure that the science was well done and that good scientists would be attracted. And although I've never read definitive words on the subject, I presume that is why the University of California was asked to manage Livermore and Los Alamos. And then when Livermore, the second lab came along, that was done as a sidearm of the Lawrence Berkeley Laboratory, which already existed, and therefore it was natural to have

the University of California manage Livermore since it managed Lawrence Berkeley and also managed Los Alamos.

But the desire to have the university there to inculcate good science was there from the beginning and I think it's had its tension all the way along against a very different form of thinking, and that different form of thinking is that the national laboratory administration is something that is a prize to be won through competition and it should be treated the way any other government contractor is, by competition in a very full set of rules.

So the history of the University of California's involvement with these labs really reflects those two tensions going against one another over time and a somewhat unnatural marriage between the two ideas. The original idea, in its more modern form, being that the university is asked to do this as a public service and does it as a public service and the other side of it being, well, there are many other outfits that could manage a national laboratory and some probably better than you. We should hold a competition and you should make your bids and compete. Buried underneath that is another layer as to what will be at stake in the negotiations for successive contracts and how will it be done. And the difference is this: that in the early years there would be contracts for a given number of years and then the Department of Energy, as it became, would make the decision to seek a renewal by negotiation with the University of California. Put the two parties at the table even up, negotiating issues of research freedom, greater control over this and that, but with both sides coming at it equal. Once the government decided that it would go to having a competition, it then puts out a request for proposals. It makes a unilateral statement of what it wants and then you and anybody else who wants to bid competes toward that unilateral statement. So that changes the ballgame. It's no longer a matter of two parties negotiating even up as to how this thing they have historically done will continue to be done. It is instead a matter of the government being able to force a basic definition onto it and then requiring competition.

And I think over the period of time, from the beginning of our involvement with the labs up to and through the years I was involved with it, and to the present day, those big forces have been at work and we've seen a change from, "University, would you do this as a public service in order to make sure we have the best science?" We've seen a change by various degrees over the years to where now it is very explicitly a matter of competition for contracts and those being predefined competitions. And concomitant with that, a great escalation of what has been asked of the university or whoever is going to manage the labs. So what I have is a window of nearly a decade during that history of 1943 to 2011 so sixty-eight years.

37-00:57:29

Redman:

And do you know around what time this competition was entered into play?

37-00:57:37

King:

Well before my time. Probably back in the seventies and eighties. There was a decision of whether to compete that was made by the government each time and it was always made in the direction not to compete until 2005. So all negotiations before 2005 were a matter of the two parties sitting down and creating a new contract, with it being known from the start of the negotiations who the desired contractor was, which was us.

37-00:58:21

Redman:

And I'm curious. Who would want to take over that?

37-00:58:25

King:

Who would want to take over all of that? Well, you've got my key question on the whole thing right now because this really has been a burden on the university in many ways and I think the size of the burden increased considerably during my time and in the decade before. So who would want to compete? Well, those who manage national labs. There is another university. There is more than one other university who manages national labs but another one who is a big manager of national labs is University of Chicago, which has Argonne. Then there are smaller ones at places like Princeton, Iowa State and Stanford—the Stanford Linear Accelerator Center. But among the big ones, there are a few universities. I think it would take a very big university to do a management job. But there are other people who want to manage and they are in the business and they're doing it for the revenue associated with managing. That includes Battelle Corporation, whose business is managing national labs and manages quite a few now. And then there are companies like Bechtel or other private companies who have managed labs. Bechtel actually has a separate arm called Bechtel National that does the lab managing. So there is competition. The monies that could be at play are big enough to make it an intense competition with a lot of lobbying and political action accompanying it. A footnote to that is that the university always took a fee that was substantially lower per size of lab than any of the other managers and it would relate it to the public service mission. And even when we took a somewhat larger fee, but there was not yet required competition, we used that fee for just three things. One was to pay the people who were in the office that did the management of the national labs and then also to give the lab directors some money they could use to stimulate new research and to have another pot of money that could be used to promote collaborative lab-UC research. We didn't take profit for other purposes.

## Audio File 38

38-00:00:00

Redman:

Before we keep going, I'm interested in the relationship between UC and Department of Energy. What is the practical—probably day-to-day is the wrong word—month-to-month relationship between UC and Department of Energy?

38-00:00:36

King:

Well, the concept is known as GOCO: Government Owned, Contractor Operated. And as it was developed back after World War II, once it got sorted out after the Manhattan Project, the idea is that it would be a laboratory of the federal government but that the contractor would operate it and therefore the people would be employees of the contractor. And so the Los Alamos, Livermore and Lawrence Berkeley people have all been employees of UC up until recently and the contractor would make the place work but the funding of it is project based and comes from the federal government. So the labs need to acquire their revenue by getting projects that they do funded by the federal government. In the case of Los Alamos and Livermore, a lot of that is nuclear weapons and things associated with it. But there is a significant amount of work at Los Alamos that's otherwise. There's a lot of work at Livermore that's otherwise and all the work at Lawrence Berkeley is otherwise. No classified work there at all. So the concept was that the contractor would operate the lab and it then would be in charge of what went on day to day and month to month. The government's role would be the awarding of projects and financial support for those projects plus deciding who the contractor was.

And so in the early days that was the nature of the relationship, although my understanding from history is that the university had to work a bit to establish its role as contractor. There's a classic story that the second director of Los Alamos was selected just by the government, without the university having its role. Ever since, the directors have been selected by the university with the endorsement of or acceptance by the Secretary of Energy.

So on individual projects there can be a lot of back and forth with the Department of Energy. And whenever anything develops an overtone of national news or of politics, very frequent contact with the Department of Energy. And a lot of what has gone on over the years that has been difficult can be viewed as things having gotten hot in Washington on some topic and pressures, encouragements and whatever having come down to the laboratory and thence the university on whatever it is. So that's a common scenario. In fact, the idea is the university should run it but, in fact, if the politics start going in Washington on a subject, the Department of Energy is going to be

very interested in what you're doing and have your own desires as to how you do it.

38-00:04:18

Redman:

And you had mentioned that the oversight of these labs is somewhat of a burden for the university, and we'll get to the rest of that. But in terms of a financial burden, it seems like there isn't one. Is that true?

38-00:04:33

King:

That's correct. There is not a financial burden and there is, of course, the fact that the money for collaborative research between the laboratory and the UC campuses is, in a sense, income to UC because it helps support some UC research. But it's not a major source of income at all. Now, all of that changed in 2005 with the new contract and a much larger fee that went with the new contract. But that's as we went to the model of a competition and UC having formed teams with several industrial corporations to bid, compete and win in the competitions. With that, the revenue became greater. And I don't have a way to speak to whether that changes the situation for UC. I expect that it doesn't because I expect that the bulk of the revenue goes to the industrial partners.

38-00:05:35

Redman:

Okay. And how long are these contracts now?

38-00:05:39

King:

They're five years now and can be ten if you get a good review after your first five years.

38-00:05:44

Redman:

Okay. And is that what happened in 2010?

38-00:05:52

King:

Yes, that's correct.

38-00:05:54

Redman:

Okay. So the group at the office of the president that oversees the lab is the laboratory management office and then underneath that is the president's council on national laboratories. Is that correct?

38-00:06:05

King:

That applies to my time. The president's council no longer exists. Let me describe what was the management shortly before I got there and then what it had become about a year before I got there or six months and then the changes that occurred during my time. So early on there had just been a laboratory management office. And I know early in the David Gardner era, the management office consisted of one person reporting to the provost, who was Bill Frazer. That one person was Jim Kane and he had clerical staff and that was it. Then various concerns were expressed in various ways about UC management of the labs.



Every time there was a contract renewal the Academic Senate would commission a study and a report on UC's management of the labs and these would come out in various ways. There was a Zinner report, there was a Gendrason report and other such names. These would reflect, unhappiness to some extent with UC doing it because there was such a feeling among the faculty and then feelings that UC should do it in some greater or different way so as to get more of an appropriate gig, get more of the things that were appropriate for UC done and done well. So a decade or so before I got there, the management was expanded by adding a senior UC person to be resident at each of the two big labs and that was Dick Kropschot at Los Alamos and Tommy Ambrose at Livermore.

Then in the contract that started a year or six months before I got there, the entire office of laboratory management came into being. May have been called the Office of Laboratory Affairs at that time. And that was under the senior vice president for business and finance and was headed first by Bob Kuckuck, who was a lab person who took on many jobs over the years, his last one being director of Los Alamos. He was the last UC director of Los Alamos up until 2005. And of course he and his wife were on our first mule-supported Sierra trip. And then Bob Van Ness, who had been his assistant, took over that office.

So as I arrived, there was an office of laboratory affairs with fifteen or twenty employees looking at things like environmental compliance, HR policy, accounting and what have you. And then I still had under me this office that was now Tommy Ambrose acting in the Jim Kane position. Jim had retired in one of the VERIPs and with Kropschot reporting into him [Tommy] and him reporting to himself for Livermore. [laughter] So there's the question of what did we do. And we would of course have involvement in any director search. The other place where we had major involvement was in the review of the programs. So that was the point in time when the president's council on the national labs came into being. Now, I had my own history with these bodies that evaluated the labs because I had been on SEAC, and if I think very hard I can remember what those letters stand for – Science and Educational Advisory Committee. But SEAC and SAAC had been two committees of senior scientific people who reviewed, in the case of SAAC Los Alamos and Livermore; in the case of SEAC, Lawrence Berkeley. And so when the president's council was made to replace those two bodies and to take on a much larger role as of the beginning of the contract that started a year or so before I got there—the president's council was formed. Several people from SAAC were brought over to the president's council. I was the one person from SEAC who was brought to the president's council and so I actually

had a time on the president's council before I became vice provost for research and therefore was there for another reason.

But the president's council on the national labs was quite distinguished people. Very known, well-known scientists or people who had themselves managed national labs, people like Lew Allen who had been—he was a major general and had also been as a retiree director of the jet propulsion lab at Pasadena. It was chaired by Sid Drell, who is a professor of physics at Stanford and deputy director of SLAC there, who had had much involvement with the oversight and review of nuclear weapons. They were very, very senior people.

So our main thing was we had that body reporting into us. They did a lot of reviewing of the lab and ad hoc committees on different subjects would feed into them and they would do the entire review and grading process for the lab because that contract required that we actually assign grades to how well the labs were doing in various specified areas. So that's what I had under me as part of my vice provost for research office for the one year and then when I was provost.

Later on, after the episodes concerning Wen Ho Lee and the missing hard drives, which were '99 and 2000, we switched to a different form of management where we actually had a vice president for laboratory management. We recruited for that. We brought in Admiral Robert Foley who had been commander of the Pacific Fleet, he was now retired from the Navy, and he remained for some years as head of that office. Bruce Darling now heads it today. So that changed us from a setup where the labs were the joint responsibilities of the provost and of the senior vice president for business and finance in the ways that I described to one where there was a separate vice president coming directly into the president who had oversight for it. And that's what existed during my day.

Then, as of the 2005 contract, everything changed. And that was when DOE did require a competition. Made it clear that in order to compete you had to have a very substantial component of business expertise in the competing—that's when UC partnered with Bechtel and the other firms. Put in bids on both Los Alamos and Livermore and won both competitions. But the change is that the lab employees are no longer UC employees.

38-00:14:25  
Redman:

Who are they employees of?

38-00:14:26  
King:

The LLCs that are the managers of the two labs. So Bechtel, UC and the other two firms have formed a limited liability corporation that has

a board, has a president and which is the manager of the lab. So they are employees of that firm. That, incidentally, created great unhappiness at the labs on a seemingly mundane issue, notably the retirement system, as they were no longer in the UC retirement system, which at that time was quite well off, and were instead in this new and not so affluent retirement system. So that's the change that happened after my time and that structure still exists today. So that's how the structure of management has progressed.

38-00:15:17

Redman:

How were the members of the council chosen?

38-00:15:22

King:

Ah. Initially it was done by, must have been Walter Massey, no doubt working with President Peltason. And all I know is that one day I received a phone call asking if I would be on the president's council for the national labs. I think actually that call may have been from Bill Frazer. So the spadework may have been done while the Gardner administration was still in its last year. So that'd be about '92—it may be a '92 contract that we're talking about. So I don't know what they went through but I know what we went through [for generating names]. It would be a matter of discussions between Sidney Drell and me and then when we had names and recommendations we would go to Dick Atkinson.

Incidentally, in my summary of the ways it was managed I left out a couple of years because there was a step between it being under the provost and the senior vice president for business and finance and before it got to Admiral Foley as a vice president and that was two years of another vice president for lab management, who was John McTague, who had been a vice president of Ford Motor Company and then had also been a deputy science advisor under Reagan and was actually the science advisor itself for the last year of the Reagan Administration. Now, that's an injection back into the former bit. Okay.

38-00:17:19

Redman:

So under this council while you were there, there were five of these standing panels. Do you recall what subjects these panels were looking at?

38-00:17:32

King:

Well, I don't remember the exact names of the panels but what they did very largely was to evaluate various aspects of the science. So we would have what amounted—very senior peer review committees as subcommittees of the president's council and they would feed into the president's council, who made the overall evaluations.

38-00:18:04

Redman:

So one of these panels was the science and technology panel. And then there were panels on national security, laboratory security, environment, safety and health and project management. Are any of those worth discussing at greater length?

38-00:18:20

King:

Thank you, okay. Yes, all of them being issues at the labs. Project management was how major projects were managed and led and were they being done in the best way. National security is obvious enough. EH&S was an important issue. It was an important area where there had been concern about the labs and therefore it was important for the university to pay attention to, that things were doing well along those lines. A very large example of that being that as the Manhattan Project was done in World War II, there was radioactive material that got into the ground and into the water systems on the mesa that Los Alamos was on and at the foot of the mesas sit three or four Native American pueblos with waters running towards them. So a very sensitive and key issue and it was important that the lab not only manage that large problem but also manage its smaller scale EH&S well. So that one was important [one]. The next to last one, I need to be reminded what it was.

38-00:19:40

Redman:

Laboratory security.

38-00:19:41

King:

Laboratory security. So that obviously related to issues such as what became the Wen Ho Lee and hard drive matters.

38-00:19:54

Redman:

And how often would you or others in the office of the president meet with members of these panels?

38-00:20:07

King:

I would attend meetings of the S&T panel. I would attend all meetings of the president's council itself and that would probably be something like four or five meetings a year.

38-00:20:27

Redman:

And would they be at the office of the president?

38-00:20:29

King:

Oh, no. They would more often be at the labs. They could be at the office of the president. It would either be at one of the labs or at the office of the president.

38-00:20:42

Redman:

And I'm assuming that you weren't required to visit the labs at other times other than these meetings?

38-00:20:50

King:

I did go at some other times if there was an event or I remember once Secretary O'Leary was visiting. I went down for that. I also had some visits early on just to learn about what was happening at the labs. So I made a lot of trips to Los Alamos and Livermore.

38-00:21:15

Redman:

And how are the regents involved in this relationship?

38-00:21:20

King:

There's a regent's committee on the management of the national labs which was chaired by various people during my time. During the most active time it was Howard Leach who chaired that committee and we would meet with him. We being myself, Wayne Kennedy or Joe Mullinix when Joe got there, Bruce Darling and Bob Van Ness would meet with him for lunch every couple of months and bring him up to date on what was going on, see what questions he had or what he might like to do. But mostly the involvement of the regents in the management was light and was a matter of there being a report of that committee once every six months or so. That would be a matter of a lab director appearing before the regents giving a report on the laboratory or one of us giving a report relating to the president's council or Sid Drell giving his report.

38-00:22:40

Redman:

And who was managing the budget? Was that the office of the president or was that Department of Energy?

38-00:22:48

King:

The lab budgets were managed by the labs. So there wasn't a function in the office of the president managing the budget of the lab.

38-00:23:03

Redman:

Okay. And that was coming from Department of Energy, so OP had nothing to do with it.

38-00:23:07

King:

Yeah, on a project basis.

38-00:23:08

Redman:

Right. And about how many people do you know were overseen in this relationship? We're talking the era of big science here. It must be thousands.

38-00:23:20

King:

How many employees of the labs?

38-00:23:21

Redman:

Yeah.

38-00:23:22

King:

I can't do that one. It's not a small number. It's a big number. [laughter] But I don't have a recollection of that. There are a lot of people and the lab budgets, if you look at them, would be a very large component of the total UC budget, although usually in the reporting of the UC budget they are not included, whereas the hospitals would be. That is another big factor. But the labs had their own quite large budgets in those days.

38-00:23:59

Redman:

So it might be helpful to have on record here your description, or perhaps more accurately, of the conception within the office of the president on how these labs different from one another. There couldn't be any overlap when you're talking about such big budgets so what did these labs offer uniquely?

38-00:24:21

King:

What did they offer the UC system?

38-00:24:25

Redman:

That will come next. But what did these labs offer uniquely? And certainly the Department of Energy can give their understanding of this but I'm interested in the position of the office of the president.

38-00:24:36

King:

Well, there's no question that both Los Alamos and Livermore were formed to provide the science and technology base for nuclear weapons and those missions then got expanded so that in more recent years there had been major roles in detection of nuclear weapons as we worry about what had been in the Soviet stockpile and then also ways of assuring non-proliferation. So those are wider versions. But also every single nuclear weapon in the US stockpile has been designed by one or the other of these labs. So that's their major duty. The reason there are two labs is complex but there are really two answers to that. One is that it was felt to be desirable to have two independent labs so that one could review the other. Would provide you a stable of people who weren't with the lab being reviewed to review it. And the other much more immediate and practical issue was that—as Edward Teller moved toward the hydrogen bomb, he wanted to run his own enterprise and not be fettered by Los Alamos and so he was able to do that when Livermore was created. In a sense, Teller is the father of Livermore.

So the weapons would be divided explicitly to one lab or another. The particular weapons. The review function in effect crisscrossed between the labs. And then in the case of Livermore, during my time, about 50 percent of what it did was non-nuclear, things entirely different and Los Alamos about 20 percent of what it did was something different.

The monies for those would again come in response to specific projects that were for other parts of the Department of Energy.

38-00:26:51

Redman:

So now the big question. What benefits did the office of the president get? What benefit does the UC system get from this?

38-00:26:59

King:

Yes. Well, as long as the rationale was doing a public service that was wanted by the country, that question doesn't have to be answered because the reason for doing it is a public service and you don't have to say UC gets this, this, this in return for doing it. As the thing changed over the years and evolved, the thing, the structure, the amount of involvement from DOE, the public exposure, et cetera, that question arose very much. So I'll give you an answer and then I'll give you another way of answering it.

The first answer is that I think our benefit is beneficial collaborations in scientific research. That's there in spades for the relationship with Lawrence Berkeley, of course, It's there a good bit for Livermore because there are a lot of UC faculty who have consulting arrangements or summer employment at Livermore and not at all necessarily in the nuclear weapons end of it—Los Alamos maybe a bit less so. There are many people also who would quip over the years that the reason UC was allowed to have a Lawrence Berkeley lab supported in this way by the government was as a payment of sorts for our willingness to do the public service function on the others. What truth there is to that I don't know and I suspect not much but there are people who have said that.

Now, with each contract renewal the Academic Senate process would go on with the study and the report and then the vote by the Academic Senate system wide as to whether we should continue managing the labs or not. And that vote in the seventies and eighties would typically go something like sixty to sixty-five against our management, thirty or thirty-five for. And it would divide rather sharply along humanist social science, natural scientists, and engineer lines.

38-00:29:23

Rubens:

And the lowering of that was the anti-war sentiment?

38-00:29:27

King:

It was a feeling that bombs are bad, and UC should be not involved in this--it's an unseemly thing for UC. The argument on the other side of that is, well, if not UC then who and would you rather have just a straight old corporation managing this or is it not helpful to have UC in the picture to keep things right? For one thing, it has always been a tenet of UC that—and written into the contracts—that the lab directors

give their opinions independently and as their own judgment. So if a lab director is in a hearing before Congress, they are supposed to say exactly what they think and believe and not be somehow swung by some corporate issue of DOE. So keeping that freedom, that independence, objectivity, has been a big part of the argument that it's a good thing for UC to do.

Now, what's interesting is that there was another one of these votes in my time which had been preceded—this would have been about 1997 maybe, which makes sense. If there was a 1992 contract, there was a 1997 contract. And it had been preceded by an Academic Senate study known as the Gold report, Warren Gold. That report came out quite negative about UC management of the lab but then resulted in a situation where the rest of the committee accused the chair of having misrepresented their views. The whole thing was in effect thrown to the Academic Council and the Academic Council presented a very different report that was favorable. There was a vote of the faculty and that one went 60/40 in favor of our management of the labs. What changed? And I think two things changed. One is that with the appearance of the UCDRD funds in the '92 contract we had a lot more collaborative research going between the labs and the UC campuses and so the likelihood that a professor would know somebody down the hall who had good research interactions with one of the labs was much greater and I think that was one issue. And the other one, very interestingly enough, we have referred to this earlier, I believe is the VERIPs, the Voluntary Early Incentive Retirement Program of the early 1990s—I think they were in '92, '93, and '94 -- put out a substantial number of UC faculty through retirement. At Berkeley that number was something like twenty-five percent of the faculty. It was a generational change. I think there was a generation of people who had grown up with nuclear weapons and the threats and fears of those that had pervaded things in the forties and fifties who had been bothered by the university's involvement who largely retired and I think the newer generation of people in UC have a different and much more pragmatic view of the whole thing, not colored by all of that from the early years of the bomb.

38-00:33:17

Redman:

So would you say that the office of the president did not have to address public resistance or resistance within the UC system?

38-00:33:32

King:

Well, much less concern within the UC system. Of course, we had Warren Gold and his first version of the report. But the other thing we did was that, particularly the vice provost for research would go around to campuses. Many of the campus senate divisions had forums on the lab management and the vice provost for research would go out



and appear at those. Others might go and appear. Chuck Shank went to a couple of them, the director of the Lawrence Berkeley lab. And so I think in a more systematic and effective way we had people who could present a knowledgeable version of what went on between UC and the labs, have them be in these discussions was a positive thing.

38-00:34:34

Rubens:

Are you shaping some of that?

38-00:34:38

King:

Yes, I did that. I encouraged the vice provost for research to go out to campuses.

38-00:34:44

Redman:

And in terms of not just the weapons issue but also the nation's nuclear waste: the national labs have played a central role in both research and development with that but then also acted as a sort of a soundboard. So did this provide an extra layer of complication for the office of the president as the nation became more and more aware of this problem?

38-00:35:17

King:

Certainly in my time the nation was well aware of issues associated with these labs. Well, the nuclear waste was an issue. The facilities for storage of it and there was some—it was not just Yucca Mountain. It was things out before Yucca Mountain, like WIPP in New Mexico, or Waste Isolation Pilot Plant. But that was a nuclear waste storage issue. So yes, the labs were very much in the public spotlight and I think that's on the negative side for the university because the way things get into the public spotlight is not through how good and wonderful they are. It's through what problems or negative things associated with it can come out and definitely we had a number of quite negative image things to deal with during my time.

38-00:36:16

Redman:

So the national labs are intended to provide contributions not only to research but also to education and public service. Can you explain what the labs do in those areas?

38-00:36:35

King:

They do a lot of research. They do a lot of policy studies. With regard to education, the Department of Energy has from time to time, depending upon the values and priorities of the Secretary of Energy, has had very specific and formal programs of trying to get lab people out there talking to the community. There's been a significant amount of that. There are museums also, which is another way of reaching the community. The labs have tried to do public service and we did set up at Los Alamos efforts that would try to help the neighboring schools in New Mexico and also provide assistance of one kind or another to the

pueblos, which were the Native American tribes. So the lab has tried to do that. This is one of the areas where the particular interests and initiatives of the secretary do change from secretary to secretary and so it has come in spurts. It's not been at the same high level over time.

38-00:37:59

Redman:

And is there any sort of feeder system, whether that's a formal feeder system or otherwise, for placing UC graduate students in post-doc positions at the labs?

38-00:38:10

King:

No, nothing for UC students, although the labs do have significant summer employment and post-doc programs. The only way it would become specific for UC students is if Professor X at UCLA has a joint project with Doctor Y at Los Alamos and it would be a very natural thing for somebody who had been in Professor X's group to go with Dr. Y as a post-doc.

38-00:38:43

Redman:

So you may not know these numbers but it seems likely that there's probably some sort of majority of UC educated people going into post-doc positions. Is that likely true?

38-00:38:58

King:

Well, I don't know the numbers expressly for post-docs but in terms of general involvement with the university of all sorts, I think it's quite substantial at Livermore and less so at Los Alamos and the reason is geography. It's just not as easy to get back and forth to Los Alamos. And then there have also been issues over the years where the University of New Mexico, which after all is two hours away in Albuquerque, or some of the other New Mexico universities, would feel that they should have liaison with Los Alamos. A lot of the story of Los Alamos in the last several decades builds around Senator Pete Domenici and he would have interest in helping the state and he was also, up until 2004, a very positive supporter of UC management of the labs. So the result of all this at Los Alamos is there is substantial interaction with the New Mexico universities relating to that. And my impression has always been that it's less specific towards UC involvement as opposed to other leading universities. That is the case for Livermore.

38-00:40:28

Redman:

And how much of a partnership is there between the three labs? So would you have meetings with representatives from all of the labs or would they be separate?

38-00:40:41

King:

Anything that involved the president's council or one of its committees would be all three labs. So that was a lot of meetings that involved all

three labs. [There] Used to be two council of chancellors meetings per year to which the lab directors would come. I don't know if that's still the case or not. And for things like the assemblage of research, vice chancellors from campuses that would meet together, there are two groups. There's the council of vice chancellors for research and then there was something I think called the council on research that drew more widely and had the chair of the senate committee on research, as well as these other people, and that latter one, the lab people would come. It would typically be a deputy director or somebody of that level.

38-00:41:55

Redman:

And I'm assuming that this somewhat partnership is a function of a shared administration? So the lab directors wouldn't necessarily be flying out to the Princeton plasma lab. There isn't a relationship necessarily between national labs usually but—

38-00:42:16

King:

Well, there is in another sense, which is that the lab directors would often go to Washington together in connection with an issue specific meeting or just to represent—to deal with the nuclear weapons hierarchy within the Department of Energy. You'd have both the Livermore and Los Alamos directors go. So I would say the relationship among the three directors, certainly that between Los Alamos and Livermore directors, was quite synergistic and they were often together doing one thing or another. Lawrence Berkeley was presented with a somewhat more tenuous situation and occasionally the director of Lawrence Berkeley would want to stay away from this so as not to have the coloration of the nuclear weapons issue rub off on him or on the lab.

38-00:43:22

Redman:

And so some of the work done at Livermore and Los Alamos is classified, well, and at Lawrence Berkeley, as well.

38-00:43:28

King:

A lot. However, there is no classified work at all at Lawrence Berkeley.

38-00:43:29

Redman:

At various levels. So was this a problem for the office of the president in terms of having UC faculty moving between campus appointments and appointments at the national labs or was this pretty smooth?

38-00:43:46

King:

There's not a lot of movement of UC people back and forth to the labs and I don't think classification was as much of an issue as was different personnel setups and limitations between what had to be for a government lab and what was for the campus. So there were always

difficulties with regard to benefits in such things and moving people back and forth. There wasn't a lot of it. There was some. I mentioned Bob Kuckuck, who's a good example. He had a lab career and then came to the office of the president as the first head of that office of lab management and then went back to be deputy director of Livermore and then director of Los Alamos. But there weren't a lot of those.

38-00:44:36

Redman:

Okay. And was it problematic for the OP? These national labs are open to researchers from all over. Was that at all an issue for the OP?

38-00:44:47

King:

Well, of course, classified research is not open to people from all over. You have to have clearances in order to do it. So maybe the issue we're heading towards here is what did the office of the president do with regard to clearances and what did the president's council do with regard to clearances? For the president's council, one did have to get a clearance to go on it and a higher level of clearance for the nuclear security, national security panel. Within the office of the president, the top people all got Q clearances and then in one that became very interesting later on, there was the question of who would get higher levels of clearance. And so for a while I was the one with that higher level of clearance. That turned out not to work so well when we got to the Wen Ho Lee matter, where I presume we're heading at some time.

38-00:46:02

Redman:

And before that, I understand that the Lawrence Livermore Lab took a pretty major role in assisting the growth and development of Merced?

38-00:46:11

King:

Yeah, they did. A significant role. And you might ask why and how. First of all, it's only one hour from Livermore to Merced. Secondly, Merced was starting with no facilities and yet would hire faculty who would want and need facilities and might need facilities beyond just their own lab to get particular instruments. So there was a significant amount of ability of earlier Merced faculty to use instrumentation at Livermore and then in the other direction a significant number of Livermore people who became lecturers or adjunct professors at Merced. That latter was quite advantageous to Livermore because that lends a stamp of academic prestige to them when they do those things. So I think it was indeed a relationship that served both the Merced campus and Livermore quite well.

38-00:47:11

Redman:

Is this a good time to move to the Wen Ho Lee incident?

38-00:47:14

King:

Sure.

38-00:47:16

Redman:

Okay. As an introduction to this, how were you involved?

38-00:47:24

King:

Well, and the more general question was how was UC involved? This has a very interesting beginning, which is that the first UC had any inkling of this was two days before the New York Times was going to run its story, which broke the Wen Ho Lee matter. And I see from the Stober and Hoffman book that the date of the Times story was March 5, 1999 and so it would have been March 3, 1999 that the person with the higher level of clearance from OP got asked to go out to the office of the director of Livermore and have a conversation on the scramble phone with the director of Los Alamos. And it was at that point that John Browne told me that there was this issue of a spy at Los Alamos and the New York Times would be running a story on it in two days.

38-00:48:27

Rubens:

John Browne was?

38-00:48:28

King:

The director of Los Alamos. Well, that's nice—the one person with the higher clearance in OP has been told this. Now what can the one person with the highest clearance do? That's why there needed to be more than one with the high level of clearance. [laughter] So all I could do is tell Atkinson and I think it was Kennedy at that time, that there was going to be this big story breaking and I couldn't go into any subtext of it beyond just the simple facts. So that's a very interesting point and it gets at the essence of the GOCO relationship because it turns out that the FBI had expressly instructed the laboratory director not to inform anyone in the University of California, and the laboratory director had had to go and get dispensation from the FBI to inform me when he did, which wasn't much lead time for this big New York Times story that's going to splash this thing about a spy all over.

38-00:49:50

Redman:

What were you expected to do with that information?

38-00:49:54

King:

[laughter] Have been informed. Have some advance warning. And so, of course, what would you do? You have to let the president know. You would want to let the public affairs people know so that they can determine how to handle this thing that's going to come out of the New York Times. There is a lot you would want to do but little that we could do. And then once the story broke we could start working with what was in the newspaper on those stories. But to me it is very telling about how the GOCO relationship worked in principle, that the FBI forbade the manager of the lab from being told that there was this issue involving spies going on. And it turned out, as the thing came out further, that there had been a history of the lab trying to get special

security equipment having to do with this and how to handle it, all of which is apparent from the Hoffman-Stober book, and the DOE not having let them do it. So who is responsible for there having been a spy? And, of course, the public and the press immediately want someone to be responsible for there having been a spy. This was one of the accusations against the University of California, that our way of doing things had enabled this and had not done something to prevent it. Well, we sure didn't find out much in advance. My involvement was to be the first to be told by the lab director and then to deal with the whole thing as it unfolded.

But there was a big immediate issue for the university right after that because the Secretary of Energy came into this quite heavily because it reflects on the Department of Energy and on the national administration. So the next thing that happened was a confrontation between Secretary of Energy Bill Richardson and John Browne, launched by the fact that Richardson wanted to fire Wen Ho Lee from the lab and do so very publicly as an immediate response to this. But Wen Ho Lee was not an employee of DOE, he was an employee of the University of California and University of California employees have certain protections of process. So that one was very acrimonious at the time and it ended by Browne insisting that he had to be the one to deal with Wen Ho Lee. And I'm not sure of this. I'd have to go back and dig. I didn't find it looking in the Stober-Hoffman book. But I believe that what we did was place Wen Ho Lee on administrative leave, which meant he still had his salary for the requisite length of time that comes to him by UC personnel policy.

But there were a number of those things that went on, where there was in effect an effort by the Secretary of Energy to take over the dealings with the situation, the management of the situation, the public image of the situation and so forth, which became quite difficult.

38-00:53:42

Redman:

At various times throughout your career we've talked about sort of what was the primary issue you were dealing with. For those days, weeks, months, was this the primary issue that you were dealing with?

38-00:53:57

King:

Well, it would have had to knock admissions off of the pedestal and I'm not sure that it did. But it was certainly one of the few primary issues that I was dealing with for a period of two years, really, because it's not so long after the Wen Ho Lee thing breaks—well, the immediate thing after that is what are we going to do to fix or set things straight so that they can guard against anything of this sort happening and it was not so long after that that the missing hard drive issue appeared and presented its own problems.

38-00:54:38

Rubens:

Could I just interject and ask if you know how long the FBI was monitoring Lee?

38-00:54:46

King:

I have it only from the Stober-Hoffman book and they've dug into it quite a bit but it appears to be about three years.

38-00:54:51

Rubens:

So no knowledge of this by the director of Los Alamos or at UC?

38-00:54:58

King:

Oh, the director of Los Alamos knew early on, but the FBI said he couldn't tell UC. Indeed, I believe the FBI was in on this at a point in time when it was the old director, the former director who was still in office, Sig Hecker and then John Browne learned of this early on, upon becoming director, that there was this ongoing investigation. Another thing we got into with the Department of Energy was they wanted to fire other employees. They wanted to fire the two senior security people at Los Alamos and they wanted an investigation that would determine who had what culpability and of what sort with regard to Wen Ho Lee. The president's council did end up running such a study but we did that to make the point again that we would do it and that DOE was not the one doing it. We didn't fire other employees. We did discipline some.

38-00:56:20

Redman:

With the sort of mobilization that occurred at the level of the office of the president after Wen Ho Lee did that, was that helpful for the missing hard drives?

38-00:56:39

King:

Again there's the question of what should be our role there. To have gone through Wen Ho Lee from a public relations standpoint may have been helpful to the public relations people in dealing with the hard drive situation but I don't think there was much from the Wen Ho Lee matter that gave us a leg up or something with regard to the missing hard drives. The hard drives had the additional factor that the misplacement of them occurred during or very close in time to the Cerro Grande fire, which was a huge horrible thing. That was a fire that started in Bandelier National Monument, which is somewhat south of Los Alamos and spread into lab grounds itself and was quite damaging. And it shut down the lab for a period of time and it was during that shutdown period that the hard drives disappeared. So it had the added complication of the Cerro Grande fire. Incidentally, Jeanne and I had been down there for something or other. Jeanne had accompanied me on one of these trips and the Saturday before, I think it was the Monday that the Cerro Grande fire started, we were walking around Bandelier and in driving there had noticed these controlled

burns that the park service had started. And it was a controlled burn that became an uncontrolled burn and started the fire.

38-00:58:19

Rubens:

And what year are we talking about with the hard drive?

38-00:58:21

King:

That's 2000 on the hard drives. The New York Times and Wen Ho Lee is spring of '99. May 2000 on the hard drives. It seemed to me like they were missing forever, but as I looked in the Stober Hoffman books they were missing something like ten days [laughter] and then were found behind the copy machine.

38-00:58:45

Redman:

And how was the office of the president involved? Obviously in public relations issues.

38-00:58:53

King:

Well, the DOE determines what is done for security and the lab and therefore the contractor implement what they [DOE] want done with regard to security. So it was obvious there had been a lapse of security process there associated with these hard drives. So we had by that point started a number of audits of things at Los Alamos. I think Pat Reed, who was the university auditor in those days, tallied up something like forty-five trips to Los Alamos in connection with various things and we subsequently got into business practices, which was another story. So at that point in time the office of the president people from that office of lab management were doing a lot of onsite work at Los Alamos. Anne Broome was down there quite a bit. She was vice president for finance. And that had to do with their handling of financial matters \_\_\_ Reed from the audit side and Anne Broome from the how you do it side were there with the issue of whether lab cards were being used improperly for purchase of other items—the Mustang issue.



Interview 18: October 25, 2011

Audio File 39

39-00:00:02

Redman:

When we were last speaking with you, we just started talking about the issue of the missing hard drives at Los Alamos in 2000. You didn't actually summarize that event, so for the record, could you explain what happened then?

39-00:00:35

King:

It had happened in connection with the Cerro Grande Fire, a big two-week fire and closure of the lab. What happened was that two portable hard drives that contained information relating to nuclear weapons went missing. These hard drives had the function that they would travel in laptop computers if people needed to take them somewhere. They were missing and—by the rules that had been established within the Department of Energy—if they could not be accounted for, for more than twenty-four hours I think it was, they had to be reported as missing. The reporting then put it into the public venue, and the press picked it up rapidly, and so it was a big story. So, the questions were where were they and what could the lab do about finding them? There was an awful lot of searching that went on. There was uncertainty with regard to when the misplacement, loss, or whatever had happened, because of it being right there at the same time as the fire. That complicated it further. For those of us who had the role of overseeing the labs in the office of the president, it seemed like forever that this issue went on. In fact, it was, I think, a period of time no more than about two, possibly three, weeks. Eventually, these hard drives were found behind a copy machine within a secure area. They had not been taken to somewhere they shouldn't be. It was just that they were found back there. It never really was determined whether they had been taken in some other way, found in some other way, and happened to be put there, or whether that's where they had been all along. That did not have an answer.

But anyhow, that, coming within a year after the Wen Ho Lee matter, placed the university in a very difficult situation of negative perceptions with regard to our ability to do the mechanical or business-like things of managing the labs. Given the fact that many other audits went on, and occasionally things were found, that kept the issue in the limelight. I think those were the primary things that determined the Department of Energy's decision to compete the contract the next time around, and actually specifying arrangements, which were other than single university, that there had to be for somebody to compete effectively for the contract.

39-00:03:41

Redman:

Immediately following the public announcement of these missing hard drives, it seemed that the University of California was, almost as immediately, under a lot of scrutiny. I read that the House Commerce Committee urged that the lab terminate its contract with the university. Was this actually a real fear at the OP that this would happen?

39-00:04:05

King:

I don't think that fear was crystalline enough to be a motive or drive things. It was much more a matter of this being something that obviously was wrong and was indefensible, and it was very important to find a way to fix it. Of course the contract would be an issue if they were not found for a long period of time, or if they were found in the wrong place, but many other things would be issues, too. It was really more a matter of getting the thing resolved, rather than, oh my goodness, we can't manage the labs any longer. In fact, it was well recognized that the labs are both a boon and a liability. One really has to consider whether it's a net worth or a net loss due to managing the labs. Those conversations would occur, and obviously all the negative publicity was not helpful to the plus side of the ledger.

39-00:05:19

Rubens:

Would the regents have taken up that question?

39-00:05:22

King:

The regents became interested, of course, as soon as the university went into the newspaper. We should spend a little time on regent roles in the oversight of the labs, because that's an interesting question. Yes, at the next regents meeting, after either Wen Ho Lee or the hard drives—I forgot which—there was a meeting of the regents committee on the oversight of the National Labs. The question was raised of who has what responsibility for security matters. We answered it. As I recall, I gave one of the answers in the audience to that. So the regents were interested. But with the National Labs, there is a real gulf between the world of regents and what these National Labs are. It would be a very unusual regent who could understand well and dig into the issues associated with the National Labs. Occasionally, there was somebody from a high-tech company or something of that sort that could do this. But by and large, the regents involved were people of very different backgrounds. They had to leave the actual management, determination of policies for the labs, to somebody else. When there would be concerns is when something happened that got in the newspapers. Regents are not chosen for anything that has to do with their ability to oversee a National Laboratory. I don't know that we ever came up with a good answer to that, because the regents do have the legal and ultimate responsibility, and they need to be involved.

During—or perhaps it was after—let’s say during and after, probably, the hard drive episode, Howard Leach, one of the regents, subsequently ambassador to France, was the chair of the regents oversight committee on the National Labs. What we did do was hold a sequence of lunch meetings about once every two months, or more frequently if needed, just to keep him versed on the issues having to do with the National Labs, what was currently going on. That helped.

39-00:07:50

Redman:

Just he and you had these meetings?

39-00:07:51

King:

No, it was about three or four of us from the university and him. Wayne Kennedy or Joe Mullinix. The other senior vice president, Bruce Darling, would be in on it, and I think Bob Van Ness would be in on it. He headed the office of lab management.

39-00:08:14

Redman:

So I know this is a difficult question, but do you think that the management from UC was a part of the problem in this situation?

39-00:08:26

King:

UC is being asked to do many things in managing the labs. I think UC can’t be beat with regard to getting good science out of the labs, having the program aspects work well, and make it an attractive place for scientists. These were the primary things. I think more of a business viewpoint was probably needed for the things that were strictly administrative. This would include things like HR, accounting, and design and implementation of security policy. Who, in UC, would have a background or other duties that had to do with designing and implementing a security policy? They don’t. So that’s a de novo problem for whoever is dealing with it within UC. For businesses, it would not necessarily be de novo. Really, that logic, that it takes both the academic expertise and deep knowledge of how to run a business, that’s what led to the idea of joint management between UC and a corporation. That’s the principle behind it.

39-00:09:49

Redman:

That wasn’t an idea that came out of UC? That was an idea that came out of Department of Energy. Is that correct?

39-00:09:59

King:

It was certainly being considered and thought about within UC, before the Department of Energy put forward a requirement that there be such a policy. Yes, DOE put forward the requirement, but it was a pretty obvious road to think down for UC before DOE ever did that.

39-00:10:22

Redman:

Before the implementation of that new partnership, did UC make any changes in security, or in administration?

39-00:10:35

King:

The change that we made, and I would have to check the year, was when we first brought on a vice president for laboratory affairs. That was John McTague. There was also a point in time where Bruce Darling was given two roles. He kept his university relations role and acted as vice president for lab management. He still is that, by the way, without the university relations role. Then, after John McTague was with us for, I want to say, about two years, then we actually got Admiral Foley, Bob Foley, who had been head of the Pacific Fleet, a very high-ranking admiral, retired, in the job. He was there until recently. The change here is that the laboratory management, instead of being under the provost and the senior vice president for business and finance, was now under an explicit vice president for laboratory management, who reported to the president. The roles of the two senior vice presidents, line roles, went to that person. Which is, I think, a wise thing to do under the circumstances.

39-00:11:59

Rubens:

I'm interested in how that decision to restructure is made. Are you meeting with Atkinson?

39-00:12:14

King:

The decision is made by Atkinson. Of course, it would have a substantial component of the perceptions attached to it, as well as the realities. The realities were, now there could be somebody 100 percent time overseeing this from a high level, and not two senior vice presidents who can give it maybe 15 or 20 percent of their time.

39-00:12:43

Rubens:

Does this come out of your review of the situation?

39-00:12:48

King:

I don't remember explicitly, but where it would have been considered at some length would have been in the regular meetings we had of the president's inner cabinet. It would be the senior vice presidents, the president, Larry Hershman, and Bruce Darling, principally. Everything got discussed there, and then Dick Atkinson made the ultimate decision.

39-00:13:26

Redman:

At the same time, were there attempts to bring in regents that might have more of an expertise in laboratory management?

39-00:13:35

King:

There's nothing that has to do with the appointment of process for regents that would have anything to do with the National Labs. That's

the problem. I think there was an effort to look at the regents, and the chair of the board of regents, in consultation with the president, might say, this person might have a particular background; let's use him or her. There just simply weren't regents who were really at all close to the sort of things that the labs are and do.

39-00:14:15

Redman:

Was the OP involved in any difficult personnel decisions in this particular case? Was anyone disciplined or fired?

39-00:14:27

King:

Yes. We, of course, had had pressure from the Department of Energy, the secretary of energy, to carry out disciplines right away. The Secretary of Energy, at one point, sent a list of names of people whom he thought should be disciplined. But we believed there should be due process, and therefore the President's Council on the National Labs set up a group to dig in and make recommendations with regard to whether somebody had committed a malfeasance, and if so, what might be done about it. I think there were actions that were never explicitly announced, and therefore shouldn't be now, on about three people. It is also true that the director of the Los Alamos laboratory did resign. That was at a key time. It obviously reflected what had been going on. It was in view of that. I felt badly about that, because I respect John Browne considerably, and I think he was very much a victim of circumstance.

39-00:15:47

Redman:

Are you aware of any push from UC to have him resign, or was this something that he did on his own?

39-00:15:57

King:

It doubtless had a component of conversations between Browne and Atkinson as to what would be best, but I wasn't there for those meetings.

39-00:16:09

Rubens:

Were you there at the lab? Did you make a few trips when this was going on?

39-00:16:13

King:

Yes, I would make several trips. Not that many during the Wen Ho Lee and the hard drive matters, because these weren't programmatic matters. Remember that the office of laboratory affairs came under Wayne Kennedy and Joe Mullinix, the other senior vice presidents. They and their people—like Anne Broome, VP for finance, and Pat Reed, the university auditor—made quite frequent trips. The division of function between the two senior vice presidents was that the business administration and finance aspects are with the other one, and the program—that is, what is the science, how are the scientists

handled, how are they enabled, et cetera—is with the provost. That is essentially what the division was. But given that division, there wasn't, then, a direct role for the provost with regard to what were the problems at play.

39-00:17:22

Redman:

This might be impossible to answer, but would you guess that had the Wen Ho Lee incident not just immediately occurred, there wouldn't have been as much of a backlash against UC?

39-00:17:36

King:

Oh, I think that's quite correct. I think that also with regard to the hard drive incident, and I think it also, later on, with regard to the Mustang incident. I wasn't involved with the lab management at all at the time of the Mustang incident, but that's another one that got into the newspapers.

39-00:17:58

Redman:

Did the confluence of the Wen Ho Lee incident and the missing hard drives lead more and more people at OP to reconsider what UC was getting out of this relationship?

39-00:18:15

King:

Sure, but I think there are also other areas of concern. It's not just at OP. What would be the collective view of the chancellors? What would be the thoughts expressed by the system-wide Academic Council and the senate? These were also important. It is interesting that this came so soon after we had had a change of the votes that used to be sixty-forty from the faculty, against UC management of the lab, to the other way around, because, in that sense, there had become a much more positive view of the faculty. The faculty and the population of the university in general don't like to see us running in the newspapers daily with negative headlines.

39-00:19:11

Redman:

You had mentioned, in our last session, that even before the Wen Ho Lee case, the OP had begun a more stringent process of auditing the labs. Why was this—

39-00:19:23

King:

DOE had.

39-00:19:24

Redman:

Oh, DOE did that. I see.

39-00:19:25

King:

Yes, and we would hear from the lab directors that there was no day during the year when there was not at least one DOE auditor present from somewhere within DOE. DOE is a huge entity. Different parts of

DOE would audit for different things. That's why there were so many audits.

39-00:19:48

Redman:

Was this seen as a precursor of perhaps weakening the UC relationship?

39-00:19:54

King:

No, it was just a general feature of DOE. It was happening to all National Laboratories, no matter who their manager was.

39-00:20:02

Redman:

So UC really was not involved with—

39-00:20:04

King:

That was not a targeting of UC. That was, I guess, probably the result of a number of people from DOE testifying before Congress in various ways, and having ultimately to give the answer of, yes, congressman, we will audit that matter within the National Laboratories. Therefore, one more audit when that sort of thing happened. It did become quite heavy and onerous. As I came in to the National Lab business, there was something called the Galvin Commission, chaired by Robert Galvin, who actually just died about a month ago. His obituary ran in the New York Times. The Galvin Commission had considered the whole complex of National Laboratories for the Department of Energy, and the functioning of them and the management of them and so forth, and made a number of recommendations, mostly on things where there could be defensive reactions within DOE. Although I think very good recommendations came out of the Galvin Commission, generally, it was one of the many things that served to sensitize the Department of Energy more on keeping tabs of everything so that they could profess to be on top of it, and show that they were to Congress.

39-00:21:29

Redman:

I recognize that this is a childish reaction that probably the OP wouldn't stoop to, but it seems to me that it's a little unfair that DOE is upping the ante of its audits, trying to be on top of everything, and then immediately blaming UC.

39-00:21:47

King:

But that's the nature of government and the game. You do try to pass the blame within government. That's very standard operation within government. Where better to try to pass it then to this university as the manager? That's one of the perils of the business. That's one of the things on the negative side with regard to managing these labs.

39-00:22:12

Redman:

So this was seen as due course, not something to be argued?

39-00:22:20

King:

I'm sure that there were arguments made, by lab directors and others, against the audits. Remember, the audits are of the lab. They're, by and large, not of the contractor. So they're between DOE and the laboratory, and therefore the person to argue from that point of view is the lab director. We certainly did have a number of deliberations and reports from the president's council on the National Lab, which was a UC body, on this subject, trying to get a more sensible approach to it.

39-00:22:57

Redman:

You had mentioned last time as well that before these major PR gaffes, it was decided that someone—you—needed to have high level clearance. But why was that decision made?

39-00:23:13

King:

Well, it was made because of the nature of what the labs do.

39-00:23:18

Redman:

Why wasn't it made earlier?

39-00:23:20

King:

I don't know. I really don't know. I do know, and let me answer this in a better way. I was not the first person to hold such a clearance in the office of the president. People in earlier administrations did. The question that led to my getting it was, here we have a new administration that doesn't have Bill Frazer, for example, in it. Yet we need, for the people from the president's council and elsewhere who look into these very classified matters, if they see something that they think is going to affect the university in an undesirable way, they have to have somebody to report it to. That actually came up in connection with a special subcommittee of the President's Council on the National Labs, which would audit the very classified programs. They would sort of randomly audit them and spend a day doing it, maybe two, three times a year. That was a group of people with very high clearance. If they found something that they thought was a UC issue, they have to be able to speak. That was why we believed they needed to be able to speak to someone, and that's why we believed there was a need for somebody in the administration to get the clearance. What we didn't realize early on is that there's a need for more than one person in the administration to get the clearance, and ultimately the president, of course.

39-00:25:07

Redman:

I understand that, because of your role overseeing university research, that made you a good candidate, but there are other ways that you could make this decision. Why were you chosen as the person to have this clearance?



39-00:25:25

King:

Because, by my own background, I was probably going to be the one most able to understand the programmatic aspects of what had been uncovered. So I'm the engineer. Atkinson is not. Kennedy is not. Darling is not.

39-00:25:52

Rubens:

The labs also fall programmatically under your purview.

39-00:25:57

King:

Before we went to the vice president for laboratory management, in the old organization that had started a couple of years before I came in, and which lasted until that change, the responsibility of oversight of the labs came under the two senior vice presidents, divided. The program aspects, and therefore the review of program and the president's council, under the provost and senior vice president for academic affairs, and the business, finance, HR, et cetera, under the other senior vice president. That was the structure during most of my time.

39-00:26:0380

Redman:

After Wen Ho Lee, it became very clear that you needed to have more than one person with this high level clearance. Did that change? Was someone else given this clearance?

39-00:26:46

King:

I don't remember what we did. I think we got very rapidly into the vice president for lab management. Of course, that person has that clearance. The change to the different method of oversight occurred, and therefore changed the picture, and there was no longer a question.

39-00:27:11

Redman:

Just to clean up a little bit from last week, you mentioned that the FBI explicitly told Browne not to share the Wen Ho Lee case with UC. Why was that?

39-00:27:23

King:

To keep the circle tight, as a security measure. That would be the FBI's reasoning, I presume. I was never told their reason, but that's what would make sense to me. It's just the more people know, the more chance there is of a leak.

39-00:27:41

Redman:

You had also questioned whether it's even worth having UC manage the labs anymore, particularly because you're not sure, with the new structure, if UC can do much for science.

39-00:27:54

King:

Actually, since our last interview and this one, I've learned a little more about how UC is doing it. I was at a meeting with Bill Frazer for

the American University of Armenia. He's in on that one, too. I asked him to what extent the functions of the president's council were still being upheld now that there was no longer a president's council. It turns out that under the actual board of directors for these two limited liability corporations, there are committees which are composed of many of the same people and have much the same role as they did in the days of the president's council. That makes me feel better about it. A thing that does make me question the relationship more now is the fact that there are more insulating layers of structure between the university itself and the lab, namely the limited liability company corporation, and the fact that the vice president for lab management is looking only at the labs, whereas one of the things that I did as provost, and I think was actually pretty darn effective, since I had the academic enterprise of the university as one of my responsibilities, I had the programmatic aspects of the labs as one of my responsibilities. Since these UC DRD funds from the contract were used to promote interactions between the labs and the academic program of UC, we could work on making that work, and we did. We did actually design and carry out a substantial program, where there were RFPs and proposals made for collaborative research between lab people and campus people. That can no longer be done, or not as readily, because you've got the campus people under one line of administration, and the lab people under a totally different line of administration, from a different company.

39-00:30:15

Redman:

You've watched UC for years. What do you think the future is for the UC National Labs relationship?

39-00:30:26

King:

For the National Lab relationship? Well, I think the Lawrence Berkeley Laboratory relationship is secure and good. The only thing that could poison that would be for some issue to arise that gives Secretary Chu some kind of very visible conflict of interest or something having to do with the Lawrence Berkeley Laboratory and his having been director of it. I think the substance and reality of the relationship with the Lawrence Berkeley National Lab is "A Number One", and very effective, and everybody knows it, and I think that will continue. Los Alamos and Livermore, there are some other questions that are very big in that matter that we haven't taken up. The United States, for many years now, has been in a situation of no nuclear testing. The program is called Stockpile Stewardship, which means that the health and maintenance of the weapons is done by means other than actual testing. Computer simulations and what have you. In that circumstance, is there still a need for two weapons laboratories? What is the future and the role of nuclear weapons in the world? That's not the same question that it was forty and fifty years ago. How much need

is there for laboratories of this sort, and what should they do? We've already seen one trend, which is that from just designing weapons, as they historically did, they have gone to issues of nonproliferation. That is, what can you do to secure the weapons that exist and catch any that cross national boundaries and all of that. Then, also, there are issues of detection. The nuclear weapon in a crate box at the Port of Oakland, for example. In that sense, they have widened the nuclear weapons issue.

I think the only way to answer your question is to do some speculation with regard to what the labs themselves will be doing in the future, and how well that fits with UC. The other question that has to come in here is, what will be the international treaties concerning nuclear weapons? How well will they work? How secure are those treaties? There's a lot of uncertainty associated with all of those things, and they can have everything to do with our management of the labs. My own personal feeling, putting everything together, is that we're sort of on the edge right now of where UC management is a truly valuable thing. Clearly, it is, in terms of the expertise and the fact that the big university can summon outstanding people, put them together to do review functions and so forth. That is positive. But it is also true that we don't have the connection to the labs that we had had in years gone by, and that it's more a matter of the university managing a totally different enterprise. I believe that universities are needed in management, rather than it being just corporations, because I think that just the business factor, without the programmatic scientific element, would not be good. It is also well-proven that labs managed through the GOCO concept of the Department of Energy, on the whole, do better than the labs that are directly managed by the Department of Defense itself. They have no contractors, no GOCO. They just manage their labs. So those are positive things.

If and as we move from where fundamental research, innovation, and outstanding science become the prerequisites, to where something more like just sheer maintenance of a stockpile becomes the issue, then there's less and less reason for the university. I think we're close to that point now. I think it does still make sense for the university to do it, but I could see the possibility of any of a number of things happening, say, ten years from now, that might change that greatly. So I don't think we're there forever.

39-00:35:46

Rubens:

What about the potential for those labs to change their focus? Related to that, would there have been the potential for another kind of international social movement to arise that would change the predisposition of the faculty so that it would oppose UC administering these labs?

39-00:36:11

King:

There are several things on that question, but let's start with the mission shift question. That, I think, is a very key question. It has been right on the front of the table for Livermore for the last twenty or twenty-five years. It does indeed have a mission that, in my time, was about half nuclear weapons and about half very different things. There is an argument to be made that once you have assembled an outstanding lab that works well, and you have other needs, that it makes sense to try to move that lab to those other needs rather than disbanding or eliminating the lab. There's a lot of sense in that. Countering that is the fact that nuclear weapons design is a very specific expertise, and that people who do that don't transfer all that easily to other things. Actually, pragmatically, I think that is probably what would happen if, for any of the several reasons I mentioned, the nuclear weapons mission became less for these labs. I think, rather than the labs going away, you would see them being put on new missions. Nothing has the character of national urgency in quite the same way that the Manhattan Project had. Global warming may have the same degree of urgency, but it's a very different problem in that it's not one for the nation to do by itself. It's a worldwide problem. But that is an area the labs could move to more and more, and they have started to move. There's a good bit of work relating to global warming issues, at Livermore in particular, but also some at Los Alamos. That's the most likely scenario, is the one where they shift mission by degrees over the years. Then, UC management makes much more sense. I think there would be good reason for the university to stick with it under those circumstances.

39-00:38:44

Rubens:

Should another kind of social movement arise in the faculty, could that push a mission shift as well?

39-00:38:55

King:

What sort of social movement do you have in mind?

39-00:38:59

Rubens:

Perhaps something analogous to the antiwar movement in the seventies.

39-00:39:08

King:

Well, there have been, particularly for Los Alamos, citizens groups that have existed to try to change the mission of the lab to peacetime missions, as they see it. Tri-Valley CAREs is one of these. CAREs is an acronym. Tri-Valley is where Livermore is.

39-00:39:30

Rubens:

But the faculty is quiescent on this issue now.

39-00:39:33

King: Pretty much, yes. The faculty is quiescent. The thing that moves the faculty is productive, good, joint research with the labs.

39-00:39:48

Redman: I guess we'll have to wait and see. We'll come back in ten years.

39-00:39:59

Redman: You had mentioned wanting to discuss a little bit more the role of LBNL in landing the energy biosciences lab. You had mentioned the faculty there, the scientific work, and a bit about the structure of the organizational model.

39-00:40:21

King: Well, it really has to do with the history at Berkeley of multidisciplinary research and of what I will call organized research—research outside the structure of the academic departments. In many ways, Lawrence's cyclotron was the first of these, and the Lawrence Berkeley Lab, by appearing here in the thirties, gave a way of bringing people of different backgrounds, different disciplines, together to work on particular large areas of research. That has persisted ever since. The simple story that I would try to put together—it's oversimplified, but nonetheless, I think it makes the essential point, is that as the university has moved more and more to these organized and multidisciplinary things, the existence of whatever they have had in hand has had a lot to do with their ability to get the next one. The sequence here is the Lawrence Berkeley Lab, being in existence, it was an important partner in the Berkeley proposals with regard to the governor's Institutes on Science and Innovation, which we discussed. Then the existence of both the Berkeley Lab and the QB3, which was one of those four institutes, were important for the Energy Biosciences Institute, for the Joint BioEnergy Institute—DOE institution—and I think I left one out in the original description, which is SynBERC, which is another acronym, and I can't put words with all the letters, but it is on the subject of synthetic biology, which means new organisms. I think the fact that there was an existing base of both organization, and of expertise, and of people accustomed to working together from different disciplines, gave the university a leg up in its ability to land the next one. The Energy Bioscience Institute is a large part of that sequence.

39-00:42:57

Redman: Because of Lawrence's cyclotron, UC pretty much invented the oversight of a lab like that, but then you're saying this legacy of continuing to oversee these large, multidisciplinary research units leads to the sequential establishment of more and more units of this type?

39-00:43:12

King:

Since much of the recent history of these large organized research units is biological in nature, it's important to put into the picture that the Lawrence Berkeley Laboratory did generate two divisions that deal with biology. Therefore, they had expertise and organized research capability with regard to biology, which was there and ready to join with campus people when the time came to put together a proposal for the next one.

39-00:43:46

Redman:

I would assume, either definitely or arguably, UC then has the longest-standing large-scale, multidisciplinary biology program in the country.

39-00:43:59

King:

Yes. MIT would give it a run with the Whitehead Institute there. I think, given the size of UC, certainly the size and scale of these organized research activities is largest for UC.

39-00:44:22

Redman:

Can we move on to your continued scientific work while at OP? You, as vice provost for research, served as an administrator for overseeing faculty research. You already had a career in research, and you continued your career in research.

39-00:44:44

King:

Yes, I did.

39-00:44:45

Redman:

Can you talk a bit about, first, how your own experiences in the lab, probably from beforehand, impacted your administrative style? Then we'll move into sort of the more practical—

39-00:44:58

King:

There are two reasons I kept research going for what was a long time. My last student, I think, filed a dissertation in 1999, so that was four years into the provost senior vice president position.

39-00:45:15

Redman:

This was a student that you had prior to moving into OP?

39-00:45:19

King:

My last student to complete a doctor's thesis in chemical engineering under me, I think, filed in 1999.

39-00:45:57

Redman:

I'm asking, this student was your student before you moved into OP? So there was an existing relationship there?

39-00:45:39

King:

Probably, because I think my last several students did take five years, on the average. This is a little close. 1999, subtract five, you get 1994.

It was July '94 that I went to OP. I honestly don't remember when the last started, but it was probably before I went to OP. Not by much, though. Why did I keep research going? I kept it going because I liked research. I like that mode of working with students. Also, a feeling that the time spent doing that was actually well invested, because it gave me a firsthand appreciation of what the faculty are dealing with in getting their own research done. Those were the reasons for doing it.

As I think I've mentioned before, I had to do that by doing what I will call derivative research. Namely, the next project would be the logical extension from the questions that came out of the one before. I had no way to learn a new field or undertake something entirely different. I was able to do it with continuing sources of support. The spray drying research, I would do with a succession of three-year grants from the National Science Foundation. The work on extraction, absorption, and other separation processes was through the Lawrence Berkeley Lab, from particular parts of the Department of Energy, which made it not automatic, but a very likely thing that it would continue into the next year. It was in no way a brand-new competition with only a 20% chance of getting a grant, which is what the NSF is. So I did that. I think it would be worth some conversation on how I did it, my style of operation. I've forgotten whether we've talked about why and how I did ultimately stop research. If we haven't done that, we should do that.

39-00:48:08

Redman:

Just very quickly, these grants that allowed you to continue maintaining research, who was the primary author? Would you sit down and write these grants?

39-00:48:18

King:

Oh, yes. That's quite a big deal for a National Science Foundation grant. Extreme care is needed because of the fact that it's going to be reviewed by lots of people. NSF grants are quite competitive. As I say, a success ratio of 20% is about what it was in those days. The DOE one was different. It was a matter of satisfying the program officer that you were doing good stuff. That related to it being National Laboratory research. If I had been in an openly competitive program of DOE, then it would have been more like NSF.

I kept research going full-tilt through my chair and dean days. I think I was up to about fourteen students at one point while I was dean. That I could do, and it was all there in one place. Yes, I would make an effort not to see research students in my dean office, to go instead to my professor office, but it was a minute and a half walk between the two. Then it became a matter of my provost for professional schools and colleges office here on campus, which was in California Hall. That

took some more careful scheduling, but I continued with a goodly load. I would say probably six to eight graduate students at any one time during those years when I was provost. Then life was complicated substantially when I went down to Oakland, because it isn't a walk back and forth between offices. The students are in Berkeley and you are in Oakland. Very fortunately, it was just about at that point in time when email appeared on the scene. I did an awful lot of back and forth with students by email, including during the day. I've always done that on email, and I think we talked about that in the past. I am carrying out twenty conversations at once on email, and do try to pay attention to it every day, during the day. You can actually have five or six emails back and forth from each party in the course of that. This was very helpful—a very important change in the way one could do things. So I would do that, and then I would schedule time with the students in the evening. I would do that on my way home, so be at Berkeley between, say, 5:30 and seven, something like that, to see my students.

39-00:51:11

Redman:

About how many times a week would you do that?

39-00:51:14

King:

I would do that once per two weeks. Email really came in and took a large amount of the load. During that time, I had, in the back of my mind, is this a good experience for the students, or is the fact that I'm seeing them with that little frequency face-to-face making it a less than good experience for them? I tried to make honest judgments on that, and they certainly seemed to think it was going well, so I kept it going. The next thing to come along, which had always sort of challenged me, was, when the day comes that you do give up research, just how is that done? Here, you've got about three grants, and you've got all kinds of things going on associated with each of those grants. The students, some are first-year, some are second, some are third, some are fourth, and they're not moving in batches. What do you do if you want to stop? Is it simply a matter of stopping applying for grants? But then you've got the problem that you still have students who haven't graduated when their grant ends, so that's a reason to get the next grant.

This was all made very straightforward and simple for me by the move of the Gingrich Congress to eliminate the Office of Industrial Programs within the Department of Energy. They eliminated the whole office. Of course, what they were trying to get rid of was those programs that actually dealt with startup companies and companies a bit beyond startup, to, as they would say, pick favorites or pick winners in the industrial world. They were very opposed to that, and so that program was gotten rid of. But that program had one fundamental subprogram, which was the one supporting my research, so it went



away, too. All of a sudden, all I had was residual DOE funds, and residual students supported by those funds, but the agreement from DOE that I could use those funds over time. I extended and extended again the grant periods, and in that way got the DOE students out. At the same time, a National Science Foundation grant was coming to an end, and the one doctorate student supported off of that was graduating, and so there I was. I figured, okay, this is when you quit. You're down in Oakland. You're doing this big administrative job. You're going to do administration the rest of your career, probably. It's not going to get any better with regard to supervising students. This is the time. That's how I made that decision.

39-00:54:23

Redman:

I'm assuming the numbers of students dwindled, then?

39-00:54:27

King:

I was down to four in the last two years.

39-00:54:30

Redman:

So you had fourteen at one time, then this reduced until you didn't have any students.

39-00:54:32

King:

Three were on the Department of Energy grant. One was on the NSF. Incidentally, the last NSF project was one I thought was one of my very best pieces of research. In that sense, I was very sorry not to be able to carry it on further.

#### Audio File 40

40-00:00:13

Redman:

Regarding some of the research projects that you had going on while you were at OP -you had mentioned that these were, as you termed them, derivative projects, or moving carefully from one project to another. Could you explain some of these projects?

40-00:00:48

King:

Well, it was my two long-term fields. With the Department of Energy, it was separations by extraction and absorption. At that point, it had turned to where it was separation based upon reversible chemical complexation. So you would seek a chemical interaction between the absorbent or the extractant and whatever molecule you were trying to take up with it. That chemical reaction had to be readily reversible, which means, with not large changes of temperature or pressure or solvent or whatever, it would go back in the other direction. That would regenerate what's called the separating agent. So the reactive extractant or the reactive absorbent is the separating agent which takes up what you're trying to get out of the solution. Then you take that loaded separating agent over to some other vessel under other

conditions, and it gives back up this substance that it took out, preferentially. Because, with a chemical complexation, that gives great selectivity, which is very desirable for biochemical separations, or biotechnology separations in particular, and also can give good capacity and low energy consumption overall, if you've got the right swing of conditions for the regeneration.

The application that was in mind for the last DOE projects was making chemicals, bulk chemicals, by biological means. The items of interest were carboxylic acids and, most notably, lactic acid, because lactic acid is, among other things, a good substrate for making biodegradable polymers. You can find a lot of these little cups, plastic-looking cups, that you will get here and there, that have on them, in fact, a logo saying they're biodegradable and they're LACT something or other. So that's what I was aiming at, was the recovery of these chemicals, like lactic acid or succinic acid, that would be made biochemically, by biotechnology. Not fancy biotechnology, but nonetheless, very different from making them out of petroleum sources. So that's what I was doing. Then the spray drying was the other subject. That I had been doing for many years.

The last project I had. That I said was one of the ones I liked the best, was one where we would hang a single drop in a stream of flowing air, and it would dry. You would put a very sensitive detector just above the drop. The flowing gas is flowing upwards, so that's downstream of the drop. That detector would detect a single, very, very dilute substance coming out of the drop. So what I did was to use silicon hexafluoride, six fluorines, on the molecule. There is extreme sensitivity of electron capture detectors, which are used in gas chromatographs, to that kind of highly halogenated molecule, such that there have actually been experiments done where somebody releases a little bit of SF<sub>6</sub> into the atmosphere up in the Lawrence Berkeley Lab, and somebody else stands down on the Berkeley Marina and monitors the diffusion of that SF<sub>6</sub>. You can see that it's sensitive at extremely dilute levels.

The dilute substances I was interested in were flavor and aroma molecules in a liquid food. What we were able to do, John Hecht, my last student, and I, was to photograph, videotape, a drop while it was drying and watch it bubble and break and change in its shape and appearance and morphology, and see what releases of the volatile component accompanied those particular changes. Since that was the dominant factor controlling the loss of these volatile substances, and we want to keep the volatile substances because they're flavor and aroma, you would then know what you want to do with regard to having or not having these bubbleings and changes of shapes in the drop as it dried. So that's what we were doing. My students, towards

my last several projects, really got into this business. I even had one who would photograph or videotape his drying drop, and then went around finding what was on his CDs that might accompany it well. So there was the drop. This was a big hit at seminars. You put up this drop, and it's bubbling and boiling away, and it's dancing to, say, the Waldstein Sonata. Beethoven. We did that, too. Let me say my very creative student, Tarric El-Sayed did that. I said immediately, "Please duplicate this tape. I'm taking it with me for any seminar I give." I can play that one for you sometime. I've still got it.

40-00:07:23

Redman:

Just a quick question about this first research that you were explaining, in terms of biotech. Because the chemical engineering department had gotten interested in biotech projects early—

40-00:07:35

King:

Well, I had. Actually, we covered, in past interviews, how the department got interested in biotech things. Really, the first step was the total conversion, by Charlie Wilke, of his research to this area. Then hiring people like Harvey Blanch, and, nowadays, Jay Keasling, who's doing everything and appearing in the newspapers weekly. I was not an early person from the chem-e department to go into this, but all those other people, none of them worked on the separations aspects. Yet, when you look at the cost, the separations are the big cost, because all of these products made by biological means tend to be highly water-soluble, and therefore a great affinity for the complex aqueous solution that they're produced in. You've got to pluck them out of there selectively.

40-00:08:30

Redman:

I just wanted to make sure that this research wasn't, in any large way, interdepartmental. This was purely within the chemical engineering department?

40-00:08:36

King:

This was my own research. That's one of my failings in research. I never did good collaborative research. It wasn't en vogue then, and I didn't reach out and try to do it.

40-00:08:50

Redman:

How would you delegate work among members of the lab?

40-00:09:04

King:

Well, it's not really delegating. What I would do is meet, with great frequency, with all the individual students, and we would have a lot of back and forth conversation on the subject. I'm a person who thinks best in discussion with somebody else, and many of my students were that way, too. The products, the research ideas, the leads from the two of us talking together would exceed the sum of what the two of us

could come up with individually, without such conversations. We would just have these creative conversations, and then, as we got through it, address the question of what it is the student should be trying to do in the next week, or two weeks, or three weeks. Piloting their work going ahead on a shorter time scale. That was usually pretty straightforward, and that would be co-invented by both of us in discussion. So “delegating” is not a word to use. It’s very even up.

40-00:10:17

Redman:

What was your relationship like with other faculty members in your department while you were at OP? Did they see you as an engineer or as an administrator?

40-00:10:27

King:

They would see me as an administrator.

40-00:10:30

Redman:

Was that a problem?

40-00:10:33

King:

If you look at what happened over the years, here I had been a professor, and I had been department chair for nine years. Now I become a dean of the College of Chemistry next. That’s something different from the department. That’s somebody from whom the department is trying to get resources. So that complicates the relationship right there, although, with me being present with them geographically, I saw them a lot. Provost of professional schools and colleges, I’m one more step removed. Then, down at OP, I’m in a different world, that they don’t live in at all. Not often was I able to come back for a departmental event. I would say maybe something like two seminars a year, when the outside seminar speaker was in some area that was very close to my own interests. It became a different relationship. Therefore, when I came back in 2004, it was an exceedingly different relationship, because no more than a quarter of the faculty were the people I had been a faculty member together with, back when that’s what I was. It’s a different relationship, and it becomes one of senior consultant, or advisor, if they want an advisor. Recognizing that that would probably be the case, I think, was one of the factors that affected my decision to do Center for Studies in Higher Education rather than [going] back into chemical engineering after I left OP in 2004.

40-00:12:22

Redman:

I know you relish a challenge, but was this relationship ever problematic?

40-00:12:31

King:

It could have been problematic, but I made a decision, very early on, that since I was not an actor within the department anymore, I was not

going to be a person to express views and urgings with regard to what the department should do, policy-wise. So, speak when spoken to, not volunteer my urgings as to what this different generation of people should do.

40-00:13:00

Redman:

As you maintained research while at OP, did you also attend academic conferences?

40-00:13:14

King:

Yes. I did do that. I did hold some positions within the American Institute of Chemical Engineers. I probably went to the annual meeting of AIChE every year, up until, I'll guess, something like the year 2000. Then it became a rarity for me to go to them, because the meetings I go to now are higher ed meetings. I was an invited speaker at the hundredth anniversary annual meeting of the American Institute of Chemical Engineers in 2008, on the subject of separations. I did that, and I put on my tuxedo and went to the banquet, and Jeanne went with me. That, again, was a bit different. I think you're either in a field or you're not. It would be very hard to do all the activities and meetings that go with multiple fields, so different as higher ed and chemical engineering are. I really came to the conclusion, when I got here in '04, that the right thing to do was put my energies into the higher ed world.

40-00:14:35

Redman:

I hadn't thought about this before, but you were at OP and maintaining a lab in chemical engineering. Did you get a paycheck from the chemical engineering department?

40-00:14:47

King:

No.

40-00:14:48

Redman:

Okay, so this was pro-bono work, sort of.

40-00:14:51

King:

Yes. It was I-like-to-do-it work. My pay was always 100 percent the administrative job I was doing, with one exception. Of course, there is no such pay for department chair. You just get a small stipend on top of it for that. But the first, perhaps, two years that I was dean of the College of Chemistry, that was a 50 percent job, formally. So I was 50 percent dean and 50 percent professor. Beyond that, it was 100 percent whatever I'm doing. Except now, it's 33 percent.

40-00:15:28

Redman:

It seems like, in these lawyer-heavy times, there might be some problems with you maintaining a lab that, even if they're small, has its

own dangers, while you're not technically a member of the department. Was this a problem?

40-00:15:48

King:

Well, yes, I think potentially it is. Did I mention the year of the tiger teams in the College of Chemistry? This was when Admiral James Watkins was the Secretary of Energy and decided that safety in these National Labs was a great problem, and so he created tiger teams to go really dig into the safety at National Labs.

40-00:16:20

Redman:

Oh, I think you have covered this, yeah.

40-00:16:23

King:

Campus buildings were among these. Therefore, my lab was among these, so that's rather uncomfortable, to be dean of the College of Chemistry when you're trying to get all of this done administratively, and yet having your own lab being one of the ones investigated. You sure don't want to become the culprit who has the safety violation, nor do you want to do that when you are provost. It did give me concerns, yes. I've, very fortunately, had only one lab accident ever, and it was almost humorous. It was a student who was running a constant temperature bath, but it was to be at a high temperature. Therefore, it's an oil bath. Mineral oil rather than water. You put in a temperature controller. His temperature controller failed, and so the temperature went up and up and up one night, ten or eleven o'clock at night. Eventually the mineral oil catches on fire and makes horrible black smoke, and so the whole lab is painted black in the morning. We had to clean that. That's the one serious safety thing I've ever had, was not having a high temperature cutoff switch. I learned about them rapidly after that accident. I was sure to have high temperature cutoff switches ever since. Yeah, it's a potentially problematic situation if you are the problem, and yet you're the administrator trying to cure the problem.

40-00:18:13

Redman:

You didn't get a sense that either the chemical engineering department or Berkeley or UC had any sort of problem with you maintaining this work?

40-00:18:21

King:

Oh, no. No, they liked that. Everybody liked that.

40-00:18:25

Redman:

Then in terms of financial support of that, when you went to these conferences, could you submit receipts to—

40-00:18:33

King:

I'd charge my grant. I was very careful on that, to keep research on the research accounts, and administration on the administration accounts.

40-00:18:47

Redman:

How involved were you in terms of job placement for your students? Did that get harder as you moved more into administration?

40-00:18:57

King:

No, it didn't get harder. I did have some involvement in that. The way the campus has worked for nearly all my time here is that there is a placement center, and that a corporation comes and recruits in that placement center. Your students sign up and go to an interview with the interviewer. Or, in the case of the College of Chemistry, we did have certain corporations for which we would let them do their recruiting in a room in a college, for greater convenience. This did correspond to corporations that had given us substantial, uncommitted grants. You could look back at that and scratch your head a little, but nonetheless, that's what we did. The interviewer then will want to come see the professor to talk about the student after the interview. I would have lots of visitations of that sort. When I was down at OP, that was more likely to be a phone call from the interviewer. Then there were also cases where—well, one case—of one corporation where I had had a longstanding relationship, Proctor and Gamble, and I think either three or four of my students did go to work there. That's not so out of line with regard to what the percentage might have been just by natural occurrences, but there were situations where the student would express an interest in the company—this is what happened with John Hecht—and say, "I really would be interested in working there." So I'd call up my consulting contact and say, "I've got this student who's interested in working for you. Why don't you look at him?" So there was some of that, but I wouldn't say preferential placement. It's just that, if the student had expressed an interest in going with a particular company and I had a contact there, then I could be of help.

40-00:21:09

Redman:

In terms of your own involvement in chemical engineering, I understand, in 1998, you gave a lecture in front of the Electrochemical Society. Can you explain this? Do you remember it?

40-00:21:26

King:

It was while I was provost, yes. So there is the Electrochemical Society, which has to do with electrochemistry and electrochemical engineering. Electrochemical engineering is a part of chemical engineering. Not a large part. Charles Tobias, who had been my predecessor as department chair, was one of the founders of that field, and several of his graduates were in it. The leadership of that society came to me and asked if I would give them the plenary lecture for their meeting in 1998. I discussed subjects with him. Probably made the plea that I am not really going to be able to give you anything that is current electrochemical research. Do not count on this. Well, what can you talk on? Well, I'm interested in research universities. I can talk on

the future of the research university. That, I believe, is what I talked on at that meeting. That was, if you will, an early step towards the Center for Studies in Higher Education.

40-00:22:35

Redman:

Lisa brought it to my attention that, at some point while you were at OP, I believe, there was an entire conference created based on your work.

40-00:22:55

King:

Oh. Well, yes. I've had three special events built around my own work. One was a special issue of the journal, *Industrial and Engineering Chemistry*, which is largely my own students writing papers, and the editor having chosen to devote this to me and to my students, and then an article about me at the beginning of it. I have that on my shelves. I can produce that for you. That's one. The second one was during my OP days. It was at an American Chemical Society meeting in San Francisco. It was marking one of my birthdays. I think it must have been sixty-fifth birthday, because my seventieth was after I got here, and is a cute story when we get to it. The sixty-fifth would have been right smack in the middle of my provost days. That was what it marked then. So the special issue was my sixtieth. The sixty-fifth was, I think, a two-day, four-session symposium over at the ACS meeting in San Francisco, where you go and you give a talk to open it. Not so much students, but colleagues from other universities in similar areas of research, give papers. You sit there and admire them. It was a nice event. I think Ellen Switkes did go to one part of that.

40-00:25:02

Rubens:

Ellen said you didn't tell anybody.

40-00:25:06

King:

Well, this was a little different from what I was doing at OP.

40-00:25:10

Rubens:

It must have been quite an honor.

40-00:25:12

King:

Yes, it was a nice honor. The third one is the endowed chair that happened just recently.

40-00:25:23

Redman:

Well, I think that I have asked the questions that I was interested in. Is there anything else that you would like to add about your own ongoing research?

40-00:25:36

King:

My own ongoing research nowadays is in higher education, so I presume that will wait for the Center for Studies in Higher Education.



40-00:25:45

Rubens:

I actually have just a couple of questions of clarification. Were you consulting at all with any corporations during this period?

40-00:25:53

King:

No. I was careful on that score. I stopped consulting—well, we're going to have to check my resume to make sure I'm true. I don't think I did consulting while I was provost for professional schools and colleges. It was at that point that I decided I was at a level where it could be, in some ways, an embarrassment to the administration if I was doing something that could be looked upon as in some way a conflict of interest. This was all during the era when there was a lot of concern about more involvement between universities and industry, and was industrial research support somehow perverting the academic mission? I just came to the conclusion we didn't need to have that flying around the provost. It was okay to have it flying around a dean, but not a provost.

40-00:27:22

Rubens:

I presume that there were members of the industry who would want to ask you about your research.

40-00:27:29

King:

Oh, yes, that happens. To be going out there and traveling to Cincinnati for a day and taking a payment for the day, first of all, proper policy is that that should be a day vacation if you're going to take payment for the day, or else they've got to donate it to the university. I differentiate between going out there and going somewhere to consult for a day, and a fifteen-minute phone call from some corporation that has some interest in my research and has a question or two about it. That still happens today. I get a call about freeze drying. What do I still know about freeze drying? I try to answer it.

40-00:28:16

Rubens:

You mentioned that because of the placement of your students, you did have people at corporations you would call up and talk to.

40-00:28:30

King:

Well, primarily Proctor and Gamble. If you look at my sustained consulting record, it was only Proctor and Gamble. I did three years of consulting with CPC International also, but none of my students went with CPC International.

40-00:28:46

Rubens:

You mentioned there were corporations that gave money—

40-00:28:51

King:

To the College of Chemistry or the department of chemical engineering, in the way of uncommitted grants. That's not so common

nowadays, but it was very common back in the seventies and eighties. There would just be an annual grant from, say, Exxon Research, or Stauffer Chemical, or Intel Corporation, to the department for uncommitted purposes. We give you this; use it however you see fit. I think I may have mentioned that the way I started into administration was to become a vice chair of the chem-e department. These little gifts were coming in from the companies, and the use was to make sure that all graduate students were supported all semesters, and to husband them and figure out how best to use them to get that accomplished. That's the sort of grant, five thousand, possibly ten thousand, a year, just for general use of the department.

40-00:29:55

Rubens:

That stops, to your knowledge when?

40-00:29:57

King:

Well, there's a board in Gilman Hall that acknowledges these. I think the board had capacity for twenty corporations, and once did reach capacity, or darn close to it. I notice that nowadays it's got five on it. It's a practice that's lessening as more and more what the corporate world is looking for and valuing is the specific research relationship with somebody. Supporting a particular project rather than just, here's money for your general health.

40-00:30:37

Rubens:

You said there was one research project that came to an end that, in your mind, had the most potential, that could have continued.

40-00:30:54

King:

That's the drop. The dancing drop, with the monitoring of exactly how the volatile compound is coming out of it.

40-00:31:04

Rubens:

Regarding that, you had mentioned that this presentation with the music had been in a seminar.

40-00:31:10

King:

Yes, many seminars.

40-00:31:12

Rubens:

So this was before you went to OP? Were you running seminars when you went there?

40-00:31:16

King:

No. What happened in the chemical engineering world, and in most scientific engineering worlds, is a practice of inviting people from other universities to come give a seminar at your university. I'd probably do eight of those a year, being invited to one university or another. I don't think it's on my resume, but it's a vast, long list of universities that I gave seminars at over the years, and there's nothing

unusual about it. There's a weekly seminar in chemical engineering here, where a lot of the speakers come from elsewhere. So it was that, where you had me talking about some collection of my recent research projects, that I would be sure I could get my video of the dancing drop in.

40-00:32:04

Rubens:

During your years at OP, you were—

40-00:32:06

King:

No, not during my years at OP. This would be through my years as dean. Once I became a provost for professional schools and colleges here, that was not a good way to spend time. I couldn't defend it as being a good use of my time.

40-00:32:25

Redman:

Those drop videos were made while you were at OP, weren't they?

40-00:32:32

King:

No, two different things. The last research project was [while I was] at OP, and it did involve monitoring drop configurations as the volatile material came out. The research had to do with the volatile material. The videos were taken back before I went to OP. The research at that point was trying to explain what drying conditions cause what shape changes.

40-00:33:08

Rubens:

When you're meeting with students even while you're at OP, have they already taken their classes?

40-00:33:25

King:

I do not believe I offered new projects to students after I went to OP. I think my last students, somewhat coincidentally, were ones who had started while I was still at Berkeley as provost for professional schools and colleges. Now, had they finished their classes? That has to do with the balance between idealism and practicality. Idealism says that the students should have been at the university for a semester or two before they choose their research projects, so that they have the lay of the land, they can make a more informed choice of research director and research project. However, pragmatism has to do with the fact that nearly all the money available for student support is research assistantships from specific research grants. You do support students in these fields, all semesters, during their graduate experience. The only ways to support one out in front of their picking a project and being an RA on that project is for them to come with a fellowship, for them to have a teaching assistantship, or to use these small industrial general grants that we were just discussing. So how much of that money do you have? The way that usually worked out, originally, we could support them for one semester. Then the situation got tighter,

financially. What's more typical in, say, the eighties and now, is for the department to match students with research directors by October 1, remembering that the students came in late August, when the semester started. So about a month and a half, six weeks, after they're here. That's just because that's the only way you can pay them their money. That's an issue for a research director. I recognize the issue that your first-year students and second-year students are taking courses. The amount of time they spend on research is probably less than what the amount of payment would want, but it is counterbalanced by the fact that, in their third, fourth, and fifth years, the amount of time on the research is far more than they're being paid for. Over a graduate's lifetime, it averages out at least right, and probably to more research than they're paid for.

40-00:36:24

Rubens:

So you weren't sitting on any exams? '99 is when your last Ph.D. filed. At OP, can you remember sitting on exams?

40-00:36:37

King:

The exam system in chemical engineering was a preliminary exam, which tests you on your mastery of the field, and then your qualifying exam, which is an original proposition. There, the student is supposed to have read the literature, or in some other way come up with something that is a quandary or dilemma in the field, and therefore would be a good topic for research. They present why this is a good topic for research and how they would carry out the research. That is done late in their first year or early in their second year. The final exam, there is no final defense of the thesis, other than the fact that every finishing Ph.D. student presents what is now a Wednesday afternoon colloquium, just presenting the results of their research. Yes, I would come to those for my students.

40-00:37:33

Rubens:

Your scientific publications remain prolific at least up to 2000.

40-00:38:42

King:

Yes, part of the game is writing the paper. Now, how do you do that? I had a philosophy there, which might be worth recording. I think a large part of the educational experience of a master's or a doctor's program is helping the student with writing abilities. Helping them gain or perfect writing abilities. The student would certainly write their own thesis or dissertation, and the way we would do that is that the student would write a chapter, in draft. Feed it to me. I'd go over it with lots of red ink. I kept a red pen just for that purpose. All kinds of things having to do with the writing, I would put on there. Students generally found this quite helpful. They might not at the time, because it took some extra time to fix it all up. Another observation I have often made is that the most traumatic time in the course of a doctor

student's experience, or master's student experience, is when they hand in that first chapter, because that's when I would find out, can they write or can't they write? I don't just mean proper grammar. I mean unity, coherence, and emphasis. Putting the story together in the right way. A correlation that would sadden me is that those who had been to high school in California would tend to be the worst writers, and those who had English as a second language, from overseas, turned out to be the best writers. Oh my goodness, what's wrong with this picture? That was so. When we got to the papers, I would write the paper. The student would be co-author of it, of course, and principal author. We always arranged the authorship with the students first and me last, but I would do the draft back and forth, then, with the student. But this [i.e., the actual paper] is now a different thing. This is not working on the student's writing ability. This is working on whether we told the story in the absolute best way for the journal, whereas the dissertation is very much a matter of working on the student's organizing and writing abilities.

40-00:41:20

Rubens:

Jud, there are close to thirty-five papers that are coming out after '94—

40-00:41:31

King:

Yes. Yes! You're looking at a lot of evenings and weekends. Jeanne can tell you about that if you want to interview her.

40-00:41:51

Rubens:

Of course, the hikes still continued.

40-00:41:54

King:

Yes, the hikes continued every single year. Well, in two ways the hikes continued. Doing something in the mountains for a week continued every year, and still continues through this past summer, and no doubt next summer. Then there were the years when I was a scout master. That was—what do we want to say? '76 to '87. In those years, there was a weekend trip with the troop, one weekend every month, too. At least a one-day trip, or a weekend trip. We'd go to Point Reyes, and we'd take bicycle trips in the Napa Valley, and whatever. Canoe trips down the Russian River. Yes, they were fitting into the schedule, too.

40-00:42:55

Rubens:

How much vacation would you get from OP? Was it significantly more than as provost for professional schools?

40-00:43:03

King:

It's two weeks vacation.

40-00:43:05

Rubens:

That's it?

40-00:43:05

King:

Yes. I could have taken more, I suppose. Let me be careful here. I took three or four weeks. The two weeks is back earlier in the career. I took three or four weeks from OP, and I did it in the same way I'm doing it now, which is much of the month of August. Dick and I would have conversations. This was interesting, because when I was on the Berkeley campus, we did program our vacations so that the administrators would not be gone at the same time. Dick Atkinson had no particular interest in doing that, and he liked August, too. I think the idea was that we're there and able to work together if we go on vacation at the same time. All the other time, each is available to the other. That seemed to his preference, and it was fine with me, to be the way of doing it then. OP was without a resident president or provost for much of August. However, what I have always done over there in Mammoth Lakes in the month of August is have the email working just fine. My fastest internet connection is there rather than at my home in Kensington. I keep the email coming back and forth. When we get to the Hearst Museum, we keep the phone calls coming back and forth. There was a summer of a lot of that.

40-00:45:27

Rubens:

You were under fire for nine years. You were handling, besides crises—the scale of the portfolio, this research. So, many different things.

40-00:45:51

King:

The research at least has a different feature from the crises. The crises appear when they appear, and you have no control over it. You have control over when you do the research. It can fill in.

40-00:46:05

Rubens:

We've talked about your character, and your basically unflappable nature. But at some point, did you say, I need a break? Christmas would give a little bit of break, I suppose.

40-00:46:19

King:

Well, seeking breaks. In some ways, the scout master thing was a break, in that it was something totally different, and something I would focus my mind on. I had enough to focus on so that the other problems wouldn't be running through my mind. That's up until '87. It is not coincidental that we bought the place in Mammoth Lakes in '87, as an escape, if you will. [It] Turned out to be a rather long distance to escape, so it's better for fewer and longer trips per year. We still love it and spend more time there than we do at the Sea Ranch, but the reason for purchasing the place at the Sea Ranch in 1998, was to have a place that one could just run to for weekends. That gave us lots of different

ways of escaping. It generated another problem, which is, where did I leave this thing? Is it at the Sea Ranch, is it at Mammoth Lakes, in my office, or at home?

40-00:47:59

Rubens:

There is something about being there, even for a day it is really quite regenerative.

40-00:48:13

King:

Yes, there's that, and also, a reason for the appeal of the Sea Ranch—now, a lot of the appeal is the architectural stuff and what we know in hindsight about that. But going into it, the appeal was lots of very, very pleasant places to walk. You can go out for a half an hour, or an hour, or two hours, and find something absolutely delightful, and many different ones of these. That's nice. We do like to walk.

40-00:48:58

Rubens:

So you weren't a gym person or a—

40-00:49:07

King:

I've never been a gym person.

40-00:49:08

Rubens:

Or a daily walker.

40-00:49:10

King:

I was a tennis player when I came here, and we would go out at noontime, through the demonstrations and whatever, to the tennis courts. I had a locker in the gym for that, and all that. That stopped with tennis elbow at one point, which was fairly early on. I've just chosen to get my exercise in ways other than the gym or the pool. Namely walking outdoors. Yes, we have a Nordic Track at home. Do I use it? Nowhere near enough.

40-00:49:44

Rubens:

Maybe, as just a conclusion for today—this is going to be more indicative of how my mind doesn't always work linearly. I was thinking about how you had plenty of social functions that you had to attend. You must have known how to measure how much food you're taking in and how much you're drinking?

40-00:50:07

King:

No, I don't think I've done that perfectly. The drinking, I've tried to be careful on.

40-00:50:12

Rubens:

Because you were on stage as well.

40-00:50:14

King:

Yes, that's another reason, staying coherent. These events and the tendency to eat—that is a problem. Of course, you don't know what's going to appear on your plate. It can be whatever at some dinner out. I actually would gain weight during the academic year—that and lack of sustained exercise being the reasons. Then there are a number of years, and it even happened last summer, too, when—go to Mammoth Lakes, and you're going to spend two weeks, day hikes every day, getting ready for the big trip. Between those day hikes and the big trip, you lose a good bit. So I would be in a cycle where I'd lose at least ten pounds in August, sometimes fifteen, and then gain it back during the year, and then go through the whole bit again in August. That's not a prescription for good health. That's what happened. Last spring, there was a point when we went through a very interesting thing with regard to my blood pressure. This is a good story. We can put this down. My doctor became convinced that I just had to lose weight, and so I did lose weight. Size of portions. No cookies, no desserts, no anything. I have dropped about twenty pounds over that period of time. Then the thing that makes this story somewhat cute is that he was convinced [of the need for me to lose weight] because of my blood pressure, but then he decided that his people couldn't measure blood pressure right. So he would take my blood pressure himself, and he then came to the conclusion that my blood pressure hadn't varied at all, and yet I'd lost all this weight in order to combat the blood pressure problem. I figured that was still a good thing, and I'm trying to keep the weight off.

But that is problematic when you have all these events. That and the other thing I find problematic is that you go to some real active, lots-of-conversation dinner. Then you come home and it's time to go to bed, so you should go to sleep. Well, that doesn't work so well with me. I'm still stimulated. As much as anything, I think wanting to avoid having to keep going in high gear on these things all evening is what made me never go for a presidency or a chancellorship anywhere. Two things did that. One is that I decided that my talents were in making things work right inside. That's provost, not CEO in the form of chancellor or president. Secondly, all those evenings were not attractive.

I remember very well, early on at some event at Mike Heyman's house, which was University House, asking him or Therese—I think it was him—"How many nights a week do you have something like this here?" The answer was six. Their way of getting away from it was to go over to Inverness. I may have told this story or not, but I remember one very interesting event, which I don't think Mike would mind my telling, when we were at a dinner that was romancing a professor who might be recruited away elsewhere. He comes to me and says, "Jud,



Therese and I want to get over to Inverness. Can you find a way to break this up?"

40-00:54:31

Rubens: That's your job.

40-00:54:33

King: That was my job, to break it up.

40-00:54:35

Rubens: What did you do?

40-00:54:36

King: I went to Jeanne and said, "Jeanne, it's time to go home." I thought she was going to swat me in the face, but no, she took the cue.

40-00:54:47

Rubens: We're nearing the end of our allotted time today. I want to slip in this last question, speaking of how many social obligations there are as a president. I don't know what Atkinson's schedule was, but—

40-00:55:01

King: It was a different kind of schedule. There were events at Blake House, a good many of them, but I don't think it was anything like five or six nights a week. I think it was one or two, maybe.

40-00:55:14

Rubens: A former employee of UCOP told me he was at an event once at Blake House, and he happened to be standing next to Atkinson, and Atkinson just turned to him and said, "Do you work out?" He said, "No, not really." He said, "Come here, come here." He took him downstairs, into his basement. There was a whole set of equipment. He took off his jacket and showed him how all this stuff worked, and then said, "I think I'd better get back up there," and put his coat on and came back.

40-00:55:49

King: Sounds a bit like Dick.

40-00:55:53

Rubens: You weren't golfing with him or—

40-00:55:56

King: No. He learned to play golf while he was president. That was an interesting one. He, I guess, had never had golf before, and so he decided to take it up, and did so in a very secluded fashion until he was to the point of ability, where he decided he could put himself on display playing golf. That happened while he was president.

40-00:56:24

Rubens: But he didn't enlist you?

40-00:56:26

King:

No. I've never—well, I did, as an eighteen-year-old, play three or four rounds of golf, terribly, at some Army course. Golf has never been my sport. I like the outdoors. I like to go look at things. Mountains, lakes, rivers.

40-00:56:49

Rubens:

Did Atkinson ever come with you?

40-00:56:51

King:

No, but Rita almost did. Rita, his wife, was a member of a group of similarly-aged women that would go to portals of the Sierra. Places like Bishop Creek Lodge, up Bishop Creek, out of Bishop, right where the trails began, and stay there, three, four, five days, while day hiking. They would do a lot of that.

40-00:57:22

Rubens:

The women?

40-00:57:24

King:

Her group. She seriously considered coming with us some years.

Interview 19: October 27, 2011

Audio File 41

[Discussion begins before formal introduction.]

41-00:00:11

Rubens: Tell me about working with Richard [Dick] Blum, who became a regent 2002.

41-00:00:21

King: I overlapped a year and a half. No, I guess that's two years. He would start in March, and I ended April 1. I also had a cute thing with Dick Blum. I've forgotten whether this was in our previous discussions or not. As provost for professional schools and colleges, I went to lots of commencements, because every one of them had their own commencement. There were thirteen of them. Fourteen if you counted the energy and resources group. One of these was outdoors in the Greek Theatre, and it rained, on June 6 or whatever it was. It rained heavily. The thing does not get rescheduled back to an indoor location. There we are on the stage of the Greek Theatre, about twelve of us in a row, each with umbrellas. When you're sitting so close together and you've got each with an umbrella, you have to have one high, one low, and so forth, in order to get them to fit. So here is this rain, cascading from umbrella to umbrella, and ending up on gowns and the hood. Mine was made a mess. In fact, it actually ran. Jeanne's taking it into Virginia Cleaners the next day. They said, "Oh, we got a lot of these today." A very large number of hoods and gowns had come in as a result of that. Dick Blum was the speaker, through the rain. That's what I remember about my first encounter with him. He stood up there and gave a twenty-minute talk in the downpour.

41-00:02:21

Rubens: One of your accomplishments at OP was expanding the university education abroad programs. And we should talk about that.

41-00:02:58

King: It's worth some conversation, yes. That was my first meeting of the morning today. They're going to have their fiftieth anniversary, and they want to organize a conference jointly with the center.

41-00:03:09

Rubens: How about talking now about the Education Abroad Program (EAP).

41-00:03:42

King: Well, the Education Abroad Program was a major academic effort that came into the office of the president. In fact, before I had gotten there, just a few years beforehand, there had been a major review of the Education Abroad Program, which started in 1962, by the way. That

review had had to do with where its headquarters would be located and how it would report. There had been contention and controversy on that. The resolution that was reached is that it would be located on a campus, which meant stay at Santa Barbara, but its reporting would be to the office of the president, through the provost. I did have John Marcum, who, all during my time, was the director of the Education Abroad Program, as one of the people reporting to me. He would come up on many Monday afternoons. I would say more often than not on Monday afternoon, and we would have a meeting concerning whatever the issues were. We both had the goal of considerably expanding the size of the program. Even though UC has the greatest number of students overseas at any time, it's still a small fraction of the students at UC. We're just big.

I personally believe, and I think John was very much in agreement, that the right international experience needs to be part of general education. We can't say that general education should just have to do with civic values, and ways of dealing and working with people, and understanding values and whatnot. We are in a world that has been globalized in many ways, starting with business, but many other activities have been globalized, too. Universities probably will before too long. It is essential that our students have the access to appropriate international experiences that students from most other countries do. We [the U. S.] have a far smaller fraction of our students going abroad than most other major countries, except possibly China. There was a need to get that to happen. We looked at various ways of doing that and tried to move it along.

I want to emphasize one other thing back there. I used sort of fuzzy words, like "appropriate international experience" in describing what would be desirable, because I think that's an issue today, too. What is the best international ingredient in general higher education at the bachelor's degree level? It's not necessarily going to a study center in a country overseas and spending a semester there. There may well be better ways of doing it. That is a potential subject for a conference that we decided to do with EAP this morning, on the occasion of their fiftieth anniversary.

Anyhow, what did John and I and others do to try to increase international student enrollment? First of all, we did whatever we could to increase the capacity of the program. So there was some addition of new study centers and making sure that it was not capacity that was limiting us, but was student choice and desire, or eligibility. That's another thing that was an issue, and it remains an issue, as I understand it. There is an agreement with the Academic Senate that a student must have a 3.0 GPA in order to partake in the Education Abroad Program. To me, that is an artificial and probably high limit.

There are other things you should measure than the student's GPA as to whether they will profit intellectually from an international experience. Also, holding a limit of a 3.0 GPA cut off a lot of students from the possibility of going to education abroad. We did endeavor to ameliorate that situation. The only place that has gotten is that, for short-term and summer programs, one can go with a lower GPA—I think it's 2.85—and still 3.0 for the semester-long programs. Now, there are also campus education abroad programs, such that only about half of the students overseas from UC are doing so through the education abroad program. The campus programs do allow lower grade point averages, so there is an avenue. However, I believe in the system-wide Education Abroad Program and the efficiencies that that gains. No campus by itself could have forty-three study centers around the world, as the system-wide Education Abroad Program has. I would like to see the eligibility criteria for EAP itself made more lenient, because I think there are students that can profit well from it.

The other issue that was holding down enrollment, in addition to just simply student choice, was the need to work. We do have a very high percentage of our undergraduate students who have jobs of one kind or another while going to school. They're not going to be able to get one if they take a semester in Egypt or Poland or wherever. That held students back. Another need was to try to get scholarship monies that would enable those students to go. There are some scholarship monies now, but need to work is still a great inhibiting factor against students' ability to take part in EAP. We'll get to some discussion of how the office of the president has changed over the years. It is interesting that, with the very recent movement to take academic programs out of the office of the president, this one has remained. I think it is recognized as being a way to gain the efficiency I was talking about. You can just do more by having it at the system level.

41-00:10:52

Rubens:

Under your tenure, how many new study centers opened?

41-00:11:03

King:

I would only be able to take a semi-educated guess at that, but I would say ten, maybe.

41-00:11:10

Rubens:

Was there a strategy at all about where those should be located?

41-00:11:14

King:

No, there wasn't a global, overarching strategy. It was a matter of countries and opportunities. For example, one that opened during my time was Hanoi, in Vietnam. We had just gotten to the point where you could consider that, following the Vietnam War. That's proven to be a very popular program. There's another feature to EAP, which is

that there are a lot of what I think the program itself calls legacy students, who go overseas to these programs. If you are of Korean American heritage, you're likely to want to go to the study center in Korea. If you're of Vietnamese American descendants, you're likely to want to go to Hanoi.

41-00:12:04

Rubens:

Doesn't that mitigate against the experience—that you're supposed to have an experience in a foreign country?

41-00:12:10

King:

Yes, that's true, except these students, most of them, are truly American dash whatever country it is, so that their entire lives have been in the U.S. Their parents probably came from the old country.

41-00:12:29

Rubens:

Is it built into the project, into the EAP program, that there would be a review of it periodically? I was wondering what initiated your looking at EAP.

41-00:12:45

King:

The formal review actually occurred before my time. That was the one that led to the assignment to the office of the president and the location being in Santa Barbara. I think that that was either Walter Massey's time or very late Bill Frazer that that review occurred. It's in the same status as any other organized instructional or research activity, that it should have reviews, if it's a research activity, every eight years. At least that's the rule for the Berkeley campus. Since there's a system-wide Academic Senate, and since there was a system-wide senate committee that dealt strictly with the Education Abroad Program, they would see to it that reviews happened at appropriate intervals. None as major as the one that had occurred shortly before my time.

41-00:13:47

Rubens:

Anything to say on why it seemed important to keep the location of the office on a campus?

41-00:13:57

King:

Well, that is the running discussion on all of these academic programs that have their connection with OP: that the academic strength of the university is on the campuses, it's not at OP. There are very few people with academic backgrounds at OP. The few that are there have plenty to do that isn't academic. The argument in that direction is that it enables the people in the main education abroad office to be in contact with faculty and others on campuses, and students, much more readily than would be the case if they were located physically in the office of the president at Oakland. That's the argument for putting academic programs on campus. The argument for putting academic programs in the office of the president is that one gains either scope or

efficiency, or some other kind of effectiveness, with regard to the program. I do believe there was an argument for putting the Washington, D.C. center as part of the office of the president, because that could be a much better program looked at with ten campuses behind it than one program per campus. I think we discussed that in the past. We actually underwent a transition in my time, from having separate programs in the building to where there was indeed a single program. EAP, interestingly enough, is the big academic program that still remains with OP.

41-00:15:41

Rubens:

We'll get to OP in just a minute. Did you have to travel to certain centers to observe?

41-00:15:48

King:

I did travel to some centers, but I would do it as add-ons to something else that I was doing. To go to a center was not the reason for making a trip. If I was in a place and could find half a day or a day, I would do a center. In 1997 I went to a U.S.-China chemical engineering conference, in Beijing. I took advantage of being there to go visit the Education Abroad Program people on the Beida, Peking University campus, which was quite fascinating. I remember meeting, for about two hours, with a group of maybe forty UC students who were over there in the program. That's an interesting one. It did have a lot of students where they were legacy students from China, but it had a number who weren't. It also had the interesting feature that the program was on two campuses. The students would go during the summer and improve their knowledge of the Chinese language in a program at Tsinghua University, and then go across the street to Peking University for the program itself, now being able to actually take courses and such things. I remember that as a barren, grass-free campus, which was true of a lot of China, even as recently as 1997. I happen to have gone back to Peking University last November for a couple of meetings having to do with higher education. It's much more beautiful now.

41-00:17:51

Rubens:

Anything more we should say?

41-00:17:55

King:

No, but I think as we look reflectively at OP, this question of academic programs there or elsewhere is one of our topics.

41-00:18:02

Rubens:

Part of the expansion was also to help meet enrollment growth pressures. Did it serve that function?

41-00:18:19

King:

Yes, it does, in a strange way. A campus does not count, for purposes of a long-range development plan (LRDP), students who belong to that campus but aren't there. For example, the city of Berkeley has an agreement with the university regarding the number of students that will be on the Berkeley campus. That is true for many other campuses, too. Since we were rather capacity-limited in my day—and I'll have to refine that in a moment—but since there was a limit on capacity, the ability to place students overseas was a way of doing it without running up against this LRDP limit. We had two limits. This is the modification I wanted to add. One is just simply the agreements, in these long-range development plans, with the community as to how many students there would be on campus, which is an issue of traffic and population density and such things. The other is the question of how fast can a campus grow. Since, during my time, we were heading into what was called tidal wave two by Clark Kerr's language—the children of the baby boomers—that was a period of great increase in enrollment, and there was an issue of how fast we could grow the campuses that could still grow.

41-00:20:01

Rubens:

That's important information to get out. Just for my own edification, when you talk about campus programs abroad, what is an example of something Berkeley might have?

41-00:20:13

King:

I believe Berkeley does have some. I learned that this morning. I didn't know that until this morning. In my day, Davis was rather large and having its own programs. They take two forms. Either people on the particular campus organize summer programs overseas, or a month at some location, that kind of thing, or there are national programs, where a student can sign up with a national program and go overseas. One of the more interesting of these is known as Semester at Sea, which goes to ports of call.

41-00:20:58

Rubens:

My daughter participated in a program that was an exchange with Portugal and the College of Environmental Design.

41-00:21:07

King:

All of these are good. When you're provost of the UC system, you do have some tendency to look for what academic things would be well carried out for the entire system and at the system level, of course. I do believe that EAP is probably the best example of that.

41-00:21:29

Rubens:

When you mentioned what would constitute a fulfilling and useful experience, would you include now issues of apprenticeship or engagement with civic programs?



41-00:21:53

King:

Yes, particularly if it fits with the student's major. So, very much so. We did, of course, mention the MIT chemical engineering Practice School very early on, since I had a lot of involvement with that. It has gone international now. I just happened to read an article on it. Here were twenty students that had just completed a Practice School experience in Hungary.

41-00:22:24

Rubens:

Things are happening everywhere. Certainly, Armenia, you've educated—

41-00:22:29

King:

Since the American University of Armenia is starting an undergraduate program, that's a very good place for our EAP students to go.

41-00:22:42

Rubens:

If we make a transition now to reflection over that nine-year period you were at UCOP, I have several questions, but maybe we should start with what comes to mind for you as a way to sum up your experience. I don't know if it's best, maybe, to start with your decision that the time had come that you would no longer be in that position.

41-00:23:14

King:

Well, let me start it a different way. I didn't realize it until four or five years ago, but there are very few people in this university who have had substantial administrative experience at both the campus and the system-wide level. Therefore, there are relatively few people in the university who know each of those rather intimately, from an administrative standpoint. There aren't many of us. It has to do, again, with how many faculty academics and academic administrators go to the office of the president, and then where does the office of the president get its other senior administrators. Some come from outside, some come from inside. For the other senior vice president position in my time, Wayne Kennedy had come from inside the San Diego campus, but Joe Mullinix came from Yale. There aren't a lot of people who have seen the UC system, day in, day out, with the overview you get from administration, both at the campus level and at the system level. We're a rather select breed.

The other place I would go is, since it's an item of large controversy today, and has been for the last several years, what is the value of the system-wide administration? Is it too big, is it too small? Does it do too much, does it do too little? Is it too prescriptive, is it too limiting? All of that. My own view, after a lot of seeing this and working in it, is that there are very important roles for a system-wide administration that are in no way incompatible with the quality, strength, and

effectiveness of the academic enterprise. I believe that there's a very good reason for the University of California being one university. It's another issue on the table today because of the budgetary problems. There's a very good reason for the University of California to have one state budget for it and not ten. There is a very good reason for doing what we can to retain the public mission. There is a very good reason—given the fact that that means we are a state entity—very good reason for trying to preserve constitutional autonomy. Some of those things are what the office of the president is about.

41-00:26:28

Rubens:

You had also mentioned, in different interviews, the capacity to be agile and to move quickly when crises emerged.

41-00:26:36

King:

Yes, and I think that's true. Ability to move. If there's going to be one budget for the system, there has to be a whole budget function at the office of the president. That's unavoidable. I think another great value that was in the academic arena is the shepherding of the process whereby the academic standards are defined and codified, so the wording of the academic personnel manual and the process that leads to changes in that wording is an important role. Policies with regard to all kinds of things that had to do with research, such as the use of people, the use of animals, environmental control. By that, I mean not releasing bad chemicals. Myriad things of this nature have to be done. Since we're one university, it's very important that these be done in a way that is university-wide, else you have the weak link phenomenon, whereby there are ten campuses, and one of them exercises lower standards for lab safety, or for academic appointments, or whatever. It is desirable to have a methodology whereby the standards that are being sought and adhered to apply across the system, or else your weak link is going to get you in trouble. That's an academic role, and I think, then, another one is effectiveness and efficiency. Economies of scale with regard to things like purchasing. There, I think it's worthwhile. Of course, a banner example of the worth of a system-wide effort is the digital library. That would not be the same if it were on one campus, and the other nine looked to use it somehow from the one campus. It's important that that be something above the campuses. So there are good reasons for the existence of the office of the president.

The next thing I would reflect is that it is inherent in the beast for there to be substantial tensions between the campuses and the office of the president. I have often described the office of the president as the friction plane. Here I am, an engineer again. All the dealings with the legislature and the regents and whatever other governmental body or major body comes at the university, these bear on the office of the

president. By dealing with these things, the office of the president shelters the campus from having to have much more intensive and stressful day-to-day involvement with these issues. So there is a benefit. But how does that look to the campuses? Because the politics, the legislature, and whatever bear upon the office of the president. The office of the president does something, and whatever it is comes to the campuses. They will not recognize it as the legislature bearing on the campus. They will recognize it as the office of the president bearing on the campus. That creates the tension.

I can tell you, from my many, many years of bouncing around the Berkeley campus, there is a lot of sentiment here that the office of the president just gets in the way, messes things up, and shouldn't be. I think there's a very direct route as to how that affected what happened in 2005, 2006, after I had left, when Richard Blum chaired the regents. He was a prime force in some actions that reduced the role of the office of the president. I believe that's a reflection of something like twenty years of his having been involved with the Berkeley campus, on the advisory board to the business school, et cetera, et cetera. He was very close to the business school. He's reflecting what he heard, in a very natural way.

I do think there are important roles for the office of the president, including academic ones, to get back to the EAP discussion. There were other academic activities that were there. We mentioned Washington, but two others from my day. One was the multi-campus research units, which were all allocated out to prime campuses in recent years, but which have now come back to OP. I think there was reason to do that at the system level, so as to keep reasonably equitable treatment of all campuses by any one of these multi-campus research units. Another one that was there was the Keck telescopes. We did have discussion of that, and I did include in that discussion the reasons why I thought it had to be at OP. It was just sort of individualized arguments for each of the campuses as to why it wouldn't be good to have it headquartered on one campus. Those are some things from the academic arena.

My own reaction—and I guess it's a natural one for one who has lived in one world and then sees the world changing after he leaves it—but my own reaction is that we've gone too far in dismantling these functions in the office of the president in the last few years. I suspect things will happen over time that puts some of those functions back in the office of the president. But the interesting thing is that we've got two forces colliding. One is the question of, with all this tension and movement over time, what is the right interface between the office of the president and the campuses? The other one is the fact that the world is changing, and that the state budget will never be what it once

was. It can't be. Therefore, the revenue streams of the different campuses are changing. The situations are rather specific to the campuses. Berkeley has an ability to get a good bit of private money and industrial money. Other campuses don't have that much ability. But two of them, Davis and Riverside, have more capability than Berkeley does of getting large money from the agricultural sector, and then other specific comments for other specific campuses. It does mean that the campuses are going to have different funding mixes in the years ahead. With the diminishment of the state funding, that fact is going to become more important. That is an argument for delegation of some functions to the campus levels.

41-00:34:23

Rubens:

Could I ask you a few questions about that specifically? During the beginning of your tenure there, there was an unusual time vis-à-vis the affirmative action issue, where there was more of a sense of unity between the campuses and OP. Then, Pat Pelfrey points out that Atkinson really did more to allocate responsibilities to—

41-00:34:53

King:

Yes, he did.

41-00:34:55

Rubens:

In 1996 he spoke of the operation of the president's role needing to be open and fluid. He said that UC—this is a quote—“is a collection of ten research universities. A single, but not a monolithic, institution of ten campuses.”

41-00:35:24

King:

I think all that's good. It is true that as Dick Atkinson came in as president, which was also, therefore, early in my time, he did delegate much more to the campuses. There were two big changes. One was just putting the budget out there on the campuses much more, and much less at the discretion of the president. He did so through formulaic ways. Secondly, he took the overhead money and he instituted a policy of returning 94 percent of the overhead generated by a campus to that campus. That had not been the case beforehand. Money had been diverted, if you will, from what that recipe would have given for, say, San Francisco, to the newer campuses, which didn't have that much sponsored research, and therefore didn't have that much overhead-generating capability. That was a place of substantial decentralization and delegation in '95 and '96. But the affirmative action thing was another issue, and something very different from that budgetary delegation, because here, with the affirmative action issue, the policies and procedures of the university with regard to admissions were under heavy scrutiny. Both pressures to be sure we didn't go one iota beyond what was allowed by Prop 209 and Regents Motions SP1 and SP2. That kind of pressure, and at the

same time, the immense pressure to do everything we could to keep the spirit and effective affirmative action going. There was a place where, if a campus veered off from the system somehow, there could be a real problem, because it was one scrutiny of the entire UC system that was going on. If a campus somehow veered off through its own choice, or for whatever reason, that could be difficult. It was very important to keep the policies in bounds across the system.

41-00:37:55

Rubens:

Do you think Atkinson's push to change the budget process and to return the overhead came from his experience, particularly, of being a chancellor of a campus?

41-00:38:09

King:

Yes. Almost fully. He had lived fifteen, sixteen years as chancellor of San Diego, and so he'd experienced all the chancellorial concerns during that long period of time. He'd only been at the office of the president a short period of time. He is certainly being motivated by chancellorial thinking in doing that. That said, I do not think it was a bad decision. The other thing about that delegation, or decentralization, is that it gave chancellors much more flexibility in the use of their money. It put us, at the office of the president, in a rather odd world of having certain agreements with the state that we would do things. Yet, the campuses are going through individual determination of how they're going to use their money. Does it add up right in the various uses? Sometimes it wouldn't, and we would have to try to find a way to do something to get that back in bounds.

41-00:39:25

Rubens:

Now, was that particular problem exacerbated by the division between your side and [Wayne] Kennedy's side—the division between finance and business, and academic planning? Later on, Blum's got to take that on and say that there were inefficiencies in that.

41-00:39:48

King:

No, I don't believe that was compounded by the fact that these were divided houses. That said, let me say something else. I have worked in at least two situations, and maybe there are more, where I and somebody parallel to me each had responsibilities for a large portion of whatever it was. The first of these was when I was a provost for professional schools and colleges, and there's a provost and dean of letters and sciences, and the campus budget and faculty and whatever is divided among us as individual areas of responsibility. The second of these is the situation of what was then two senior vice presidents at the office of the president, and the split of functions and responsibilities there on many things, including the labs, which we've discussed. The only way to work in that kind of situation is extremely closely with your counterpart, who's got the other portion of the

campus or the university. You can't do it otherwise. I do fear that such situations have some tendency to fall into stove piping, where you have people in these high positions who may not have the same propensity to work together so closely. But certainly in those two situations, I was in the other person's office every day on something or other, discussing whatever issue. My four counterparts were all wonderful along those lines in doing the same thing. The counterpart here was first Len Kuhi and then Carol Christ. The counterparts at the office of the president were Wayne Kennedy and Joe Mullenix.

41-00:41:40

Rubens:

The whole economic picture has changed, and Blum sees inefficiencies in that structure.

41-00:41:51

King:

Well, I think what he first sees, or what he first works with, or what the system first works with—that's a system with a small "s," all players—start working with is the issue of whether everything that should have been reported to the regents with regard to compensation was, in fact, being reported. That was the starting point.

41-00:42:20

Rubens:

We'll get to him in a minute. We've talked at different times about the relationship with regents. Is there something from the point of view of an overview perspective that you feel was happening when you were there, and as you look back maybe would have been different in terms of the interface between the regents and OP?

41-00:42:51

King:

I don't think you can speak generically about the regents here, because they are eighteen different appointed people, and then various ex officios, and they're all different people from one another. They all have different pressures on their time and value systems and whatever. Some regents had no other fulltime job, and would spend a very large amount of time at regenting. Two examples of that were Judith Hopkinson, who had just come off of a CEO job when she became regent, and Velma Montoya. There are probably others. Meredith Khachigian would have been another. Whereas others don't have a lot of time for regenting, if they're a CEO or have a huge business of some other kind that they run. Therefore, they just can't devote that much time to being a regent. I mentioned it recently. I don't remember whether it was in one of these interviews—when Sherry Lansing became a regent first, she was CEO of Paramount Pictures. She had a person who was her staffer on regenting. John Moores had that, too. That's a pretty logical way for a CEO to work. I agree to do this thing; I need a staff person to staff me on it. In that sense, in dealing with that regent, you were dealing with that staff person.

So the regents are of very different backgrounds. I think there is an issue, which we already have touched upon with regard to the laboratories. The regents come from all walks of life. They're not educators themselves. Most of them are not alumni of UC. They come in with a limited knowledge of the university. It is extremely difficult for them to come up to speed, so to speak, on the university, and somehow gain a very intimate and detailed knowledge of all the things that—what Clark Kerr called the multi-versity—are. The selection process doesn't do anything much to weigh those capabilities of knowing the university, because what's looked at in the regental selection process is other things.

41-00:45:53

Rubens:

Of course it's primarily the governor that does the appointment.

41-00:45:55

King:

Yeah.

41-00:45:56

Rubens:

But does OP have a role in suggesting a list of eligible—

41-00:46:00

King:

It depended on who the governor was. Some were receptive to that, others not so receptive. If we thought there were particular people who might be very attractive to the governor as regents, and who we thought would make sense for the university, of course that name is going to get fed in.

41-00:46:19

Rubens:

What about this very point you're making about educating or bringing the regents up to speed?

41-00:46:28

King:

We made some efforts to do that, and I don't think they worked very well. Every time there were new regents appointed, which was every year because of the alumni and student regents, every time there were regents appointed, we would put on a day or two of the regents coming to OP and talking to this person and that person and the other person. I had an hour-long outline of things I would try to talk with new regents on. But often, that day was set without a lot of effort to make sure that all the new regents were available. As a result, most of the new regents who attended those sessions were the alumni regents.

41-00:47:19

Rubens:

The alumni regents are—

41-00:47:22

King:

They are the president and vice president—or maybe it's chair—of the UC-wide Alumni Association. There are complicated rules on who they are. One of them is from Berkeley or UCLA, and the other is

from one of the other campuses, and then there's a rotation pattern on the other campuses. The two regents who are sitting with the board are the current president and next year's president. But their way of doing that changed during my time, so there were actually two alumni regents who were there for four years rather than two years, and therefore got involved all the more. One was Judy Levin from UCLA, and the other was Irene Miura, who was a Berkeley alumni regent, and whom I came to know quite well, and who went on one of our Sierra hiking trips and was the best fisherman I've ever had on one of those hiking trips.

41-00:48:28

Rubens:

A little bit more on the regents. You're saying that the chairman of the board of regents will not to be an alumni regent?

41-00:48:36

King:

No. The chair will not be an alumni regent. The chair is chosen by the board.

41-00:48:45

Rubens:

By the whole board. There a nominations committee.

41-00:48:49

King:

Yes. Well, there certainly is a committee structure with regard to the student regent, where the regents have the final selection authority among three finalists.

41-00:49:13

Rubens:

In terms of your reflection on working with the regents, did you feel the committee structure, in general, in the allocation—

41-00:49:26

King:

I felt the regents were generally having to run hard to understand issues in the depth that would enable them to be comfortable they were making good decisions. I think it's a tough job, particularly since it's a second or tertiary job for the people who do it.

41-00:49:49

Rubens:

Especially because so much of the first years of being there was just being dominated by the affirmative action.

41-00:49:56

King:

Yeah. Then there are some things that these regents are called upon to do that are even more specialized and difficult, such as the regent who is going to be chair of that committee on lab oversight. That person is not going to be a nuclear engineer or a weapons specialist, and so there's another huge, complex world that that person has to catch up with somehow. So they're sitting there in these positions. Let me take the chair of the lab oversight committee again. If something goes wrong with regard to the labs, well, some blame attaches to that



person, who had no way to do anything about whatever it was anyhow, because of not being able to get deep enough into issues. It's tough that way.

Another one of my feelings, incidentally, today—and this is now the diminishment of state funding issue rather than the question of a proper interface between OP and the campuses—but because of the steady movement over time to much less state support and more diverse other sources of financial support for the campuses, and the fact that the campuses are different, I think it makes sense, as some writers have already observed in recent books, to go to a system of Board of Regents, and then a board per campus that comes under that main Board of Regents. It may have some regents on it, but it specializes towards that campus. We've got the odd situation now of being a state university, and I think it's 11 percent of the Berkeley budget this year comes from the state. Yet the governance attaches entirely to the state through the board of regents. That's the dichotomy I'm getting at.

41-00:52:00

Rubens:

So a state board for each campus would represent—

41-00:52:03

King:

A board for the campus that is plugged into a single board of regents of the present nature. Just add boards per campus is what I'm getting to, and delegate some functions to them. Whatever functions are attached to an intimate knowledge of the particular campus.

41-00:52:27

Rubens:

That makes sense. That's very interesting. You felt comfortable with the regents? You addressed them many times.

41-00:52:40

King:

Oh, yeah. I was at the table for an hour or two at every regents meeting, and there were a hundred regents meetings.

41-00:52:50

Rubens:

You got used to it.

41-00:52:52

King:

Yeah. Oh, yes. Then there's a lot of individual conversation with them in the hallways and the coffee room and whatnot outside. Then there were the dinners, which existed at every regents meeting in my day, and that was the senior administration and the regents and spouses. That was another opportunity to get to know them. Yes, I got to know a lot of regents very well.

41-00:53:19

Rubens:

Do you feel that the relationship was good? I'm asking this question really in tandem with, did you take any deflection that might have been directed towards Atkinson? Were you someone to sort of, if you will, shield Atkinson, or absorb some of the intense feelings?

41-00:53:44

King:

I think Bruce Darling was more in that role, because Dick had asked him to be the person to monitor and work with regents on various issues that weren't academic, were the hot issues of the day for the university with the regents. So Bruce definitely had that role. I think I had it to a lesser extent. But I would also say that if a regent had a concern, they're not going to be satisfied just simply talking to the provost or to the VP for university relations. They'll go to the president.

41-00:54:20

Rubens:

But you mentioned at one point about how Atkinson, at some point, would just be through with his attendance at a meeting. He was there for a while and then left.

41-00:54:31

King:

Not at regents meetings. He would sit through regents meetings. This would be meetings of other groups and committees within the university. Oh, yeah, he attended every moment of every regents meeting.

41-00:54:43

Rubens:

Would you sit next to him?

41-00:54:44

King:

No, I didn't sit next to him. He is a regent. That's why. I was a presenter of issues, because he can't present issues. He's a regent. No, I sat in for him once, but that was the time when the final selections on the governor's institutes were the same day as a regents meeting.

41-00:55:08

Rubens:

Right, I remember you saying that. Were there any other examples of delegations that Atkinson—you mentioned those two big—those are the biggest areas, but was there anything else that you'd point to about Atkinson trying to delegate more to the individual campuses?

41-00:55:38

King:

Certainly the decentralization of the budget, which was done very soon after he came into office. That's one of them. But the other one is allowing them flexibility with the budget, in the use of the budget. The redistribution of the overhead was a significant issue, but it is also true that in my day there were—well, there's been a progression over time with regard to—or a retrogression over time—with regard to how much in the way of funds the office of the president has to do good

deeds. A good deed would be, for example, help Santa Cruz with the startup of engineering, which we did while I was there. Another good deed would be get Merced going. These are things that don't fall out of the formulas and recipes for distributing funds, but you want to do. The progression over time of that is that, before the Atkinson administration, the president had quite a bit of funds to do that. With the delegation of the budget to the campuses, and with the decision to put 94 percent of the overhead money out there to the campuses, the resources of the office of the president became much less. That has gotten still more constrained in the years since I left in 2004. There is a point of great change, and, I think, of a detrimental nature. I think it's gone so far that the president really has too limited an ability to fund something special and needy. I think they're going to have a problem the next time if we ever start a new campus, like we did Merced—and there's a question as to whether we will because of the arrival of internet instruction and things like that—but if we ever get into that again, it's going to be far harder for the office of the president to do that. It's going to have to be done through budget initiatives to the state, and that brings its own problems. Merced was a huge issue at the legislature level.

41-00:58:04

Rubens:

Now, one of Blum's critiques was that there needed to be more long-range planning. How would you assess the extent to which there was long-range planning going on while—except for affirmative action. We know that that was a preoccupation—

41-00:58:23

King:

By the nature of the setup of the university, and the understandings and the ethics of the university, the academic planning with regard to programs is done, very largely, or even completely, at the campus levels. The way the office of the president would get in there would be almost as a middleman. If two campus planning efforts had led to new law schools, and there could, at most, be one, then that issue hits the office of the president, who has to find a way to do something sensible to contend with the situation and deal with it right. Neither the office of the president nor the system in the broader sense—and by system in the broader sense, I mean including the council of chancellors, the various councils of vice chancellors, et cetera, that are system-wide but aren't the office of the president—none of those bodies dealt with campus planning issues. Campuses dealt with planning issues. That's just the way things have been. I do think that, in that particular time, Dick Blum and some other regents would like to have seen more top-down planning rather than bottom-up planning.

41-00:59:53

Rubens:

Your discussion right here is regarding how it affects the campuses, but he's also claiming that, in terms of a system, that it struggles from budget cycle to budget cycle and—

41-01:00:05

King:

Oh, yeah. Well, yes. I think those were perhaps code words also. By that, I believe what he is really referring to is the perception of Larry Hershman being such a dominant force with regard to the budget of the university. Larry most definitely was a person who looked one or two years ahead, and not ten years ahead. That is true.

## Audio File 42

42-00:00:06

King:

I guess what Karl [Pister] is saying is that he doesn't believe that Larry [Hershman] represented the outreach needs with high enough priority in times like that two-month silent period, when the governor's budget is being developed.

42-00:00:23

Rubens:

I think that's exactly what he's saying.

42-00:00:27

King:

That's a judgment to be made. The outreach thing was, with great suddenness, up to a very large amount of money, and that's not the way to spend money efficiently and effectively: to zip it up and pass it out without much time to think.

42-00:01:17

Rubens:

Do you think we got that discussion about—

42-00:01:30

Redman:

Yes.

42-00:01:41

King:

I think the outreach was a specific issue, so Karl's point is one point, and Dick Blum's point is another. Dick Blum's, I think, related to the amount of truly looking ahead and trying to find ways to even things out over years. Karl's point had to do with a specific case of outreach, and probably had to do with the years when outreach budgeting was starting to decline. I never got a sense that Larry was not representing outreach needs strongly. Since I don't know what happened during the two-month silent period each year, all you can look at is the results, and the results were, yes, the outreach funding dropped. But I think there were reasons associated with the grander political scale in California that caused that.

42-00:02:43

Rubens:

Sure, but I had asked you earlier at some point, despite the two-month silence obligations, would you have pigeonholed Larry somewhere on the walk from one meeting to another, saying, I sure hope you're pushing for this outreach program? I hope this outreach program—

42-00:03:01

King:

Or whatever else would be a priority. Yeah, some of that happened.

42-00:03:07

Rubens:

But in terms of Blum's point about, specifically, was there enough attention paid to long-range planning, do you have a position on that? Do you feel, looking back, that for the system, there could have been more—

42-00:03:23

King:

I think there could have been more planning, and I think it's still a problem today. It's not so much a matter of personal choice. It's a matter of what life is like when you're in one of these high positions. I, for example, feel that the recent regents commission on the future of UC did not involve the rest of the university as much as it would have to in order to get buy-in and the ability to implement the things that would be recommended in that report. It became somewhat confrontational with the Academic Senate and Academic Council, too, I think for similar reasons. UC does not have a culture of planning top-down. It has a culture of planning bottom-up. If you're going to try to bite off a long planning exercise on something like the stability of funding over the years, which is what I understand is the point from Regent Blum, it's going to have to be done in a very inclusive way. It's going to have to be done taking a lot of the time of people who are in big jobs that are very full anyhow. It is very hard for the top administration of the university to back off and do planning. I can see things such as going off for two days, which we would do sometimes, to a remote location and having a retreat. Yes, that happens, but that involves only the people who are there at the retreat. It doesn't involve all the rest of the consulting that has to go around this big, big university in order to get buy-in on things.

I think our size is a handicap in that way—our size and our culture. It just doesn't work to get a group of twenty people together and determine what those twenty people think would be good to do, and then have it done. The beast is too big, and the expectations of the faculty, who are, after all, the creative heart of the university, are such that they want involvement. They don't want surprises announced to them. You have to find ways to do that. To my way of thinking, that's a reason for moving some top governance down to the campus level. We were talking about the individual boards before. A single campus is a more manageable entity than this ten-campus hydra.

42-00:06:28

Rubens:

I think that was a very articulate overview, and I think we've covered most of the major areas.

42-00:06:45

King:

I must say that I think that all we have discussed here about huge size and many dimensions on the system is trumped in the long run by the value of one university, one budget. I'm horrified to try to think of ten different campuses running around in Sacramento in competition with one another for budget.

42-00:07:13

Rubens:

If you don't mind, then, there are a few more issues. I think, also, one of the huge distinctions is that, by 2004, when you leave, we're not in the severest. The revenue is going down, but not to the degree it's going to be by 2008. That changes everything.

42-00:07:33

King:

Yeah, it does change everything. Looking at the years before and the years after, Dick and I had pretty darn good years for budget. It was much worse both before and after.

42-00:07:480

Rubens:

Then Atkinson steps down. There's no scuttlebutt about that. Not that he's being pushed out or—

42-00:07:58

King:

He's not being pushed out. This is a wearing job. Very few people can take a tenure like Chuck Young at UCLA, which was twenty-nine years. Dick actually, I think, is either the second or the third longest-serving UC president by one day, over David Gardner.

42-00:08:18

Rubens:

At that point, did you yourself think, maybe I've had enough?

42-00:08:22

King:

I knew that I should be leaving when Dick left. I didn't want to depart on Dick and leave him a problem. I also knew that the nine and a half years I'd been at OP was enough for that part of my life, and I should move on to other things. I knew that. Dick and I actually faced a problem, which we worked on together, when he made his decision and I made my decision. That was that it couldn't look like I didn't want to work with Bob Dynes, which wasn't the case at all. It was the fact of the turnover that provided for me the occasion at about the right time to do it.

42-00:09:18

Rubens:

I think the converse would be, were you, by staying on more, offering Dynes some kind of continuity?

42-00:09:25

King:

I ended up doing that. What I did was indicate that I would be leaving. Then I was asked to stay on as provost while the search was done for a new provost. The staying on as provost was virtually one-to-one identical with Bob Dynes' first five and a half months. Atkinson left mid-October. I left April 1 of the following year, '04. So that did put me as provost with Bob Dynes for the first five and a half months of his presidency.

42-00:10:17

Rubens:

So he knew you were leaving, and no doubt he had someone that he wanted to—

42-00:10:21

King:

He ran a search. It yielded MRC [Marci] Greenwood.

42-00:10:28

Rubens:

You mentioned last week that you were not interested in pursuing a chancellorship or a presidency.

42-00:10:37

King:

I had toyed with the idea occasionally, but all the toying does, such as letting yourself be looked at in a search, all that does is make you come smack face-to-face with the issue of what do you want to do. The times I did that, the result of that was that, I think what I do best is the operational aspect of a university, not all the external relations aspect of a university. That is, essentially, the division between the president and the provost positions, or the chancellor and vice chancellor positions, anywhere. With that, having looked the issue in the face a few times, I concluded that the provost sort of thing was right for me. I also concluded that, in 2004, at age almost seventy, it was the right time to try to get a lighter job rather than a heavier job.

42-00:11:46

Rubens:

You mentioned last week, regarding your research, that, basically, for a confluence of reasons, that came to an end. Your students had—

42-00:11:57

King:

That all ended in 1999, and the last publication is 2000.

42-00:12:00

Rubens:

You didn't want to go back to the chem-e department.

42-00:12:03

King:

Well, that was a question. That was a real question. I'd still be the only person in the chemical engineering department with my expertise. The field had moved, during the years I was gone from there, and all the more such that I would be the one person in my expertise. There was and is a large global problem that hits squarely on my expertise, which is carbon capture from effluents to the atmosphere. If I had gone to

chemical engineering again, I would have probably tried to have activities that used my separations expertise and integrated them with policy aspects of global warming, which no chemical engineer by themselves would touch, but which I, with a broader view, probably could touch now. That was one possibility. In idle moments—not many of them, but occasional idle moments—I would even do things like put down on a piece of paper eight or ten ideas of what I might do upon leaving the provost position.

42-00:13:21

Rubens: What were some of those?

42-00:13:23

King: Never on that list appeared “direct the Center for Studies in Higher Education.”

42-00:13:28

Rubens: I’m sure not. Was being a policy advisor or working with some corporation—

42-00:13:37

King: I thought of such things as higher ed consulting. There are people who go here and there around the world. There’s a big market for that sort of thing. If I wanted to do that, I’m sure that would work very well. Such things as going into the consulting business on higher ed, moving to some other university in a senior advisor, senior citizen, role. One that has happened since then that is an example of that is what Bob Berdahl has just done with the University of Oregon, where he’s a senior advisor to the president, two days a week, on the big issues of the university. That’s after he left the AAU this last summer.

42-00:14:22

Rubens: Corporate affiliation? When you talked about the science that fit so squarely with policy issues of the day—

42-00:14:33

King: No. I would value the university base more than that. The corporate structure defines exactly what you do all the time. The university gives you more latitude, self-definition, and running room. It was not a matter of how could I make the most money upon leaving the provost position, either. The UC retirement system is very good, thank you. I’m glad it’s there.

42-00:15:03

Rubens: By the way, when do you become professor emeritus?

42-00:15:09

King: 2003, as of when Atkinson announced his departure. I was actually recalled from my time with Dynes as provost.



42-00:15:21

Rubens: Is that coincidence? Is that in tandem? Is that a recognition of your service? How does that come about? I don't know.

42-00:15:31

King: You mean the recall or becoming emeritus?

42-00:15:33

Rubens: The emeriti.

42-00:15:34

King: That's a title given. Yes, I am emeritus, both provost and senior vice president, and professor of chemical engineering. The professor of chemical engineering one is automatic. The provost and senior vice president emeritus is not automatic. It is something done and granted. If there were still a university-wide phonebook, and it had in it a list of the officers emeriti of the university, I would be on it. But there isn't still a university-wide phonebook.

42-00:16:12

Rubens: I miss that phonebook. I don't like going to the computer. You have ten ideas. We've talked about a few of them. How does this come about?

42-00:16:20

King: It came about as I let it be known to the vice chancellors that I would be leaving, which was essentially as I made the decision. Two things happened. One is that Paul Gray came to me. He was, at that time, the executive vice chancellor and provost for the Berkeley campus. The Center for Studies in Higher Education had a real problem. I didn't know the depth of it at the time. It had had a search going on for something like six years for a director, with the idea of recruiting somebody from somewhere who would be a professor of something or other at Berkeley, and who would also be director of the Center for Studies in Higher Education. The role model in mind was Martin Trow or Sheldon Rothblatt, i.e., a lifelong scholar of higher education. That didn't work. It went through all sorts of ins and outs, but it essentially didn't work. They would have been unable to do that.

42-00:17:32

Rubens: Douglass was serving as acting director?

42-00:17:34

King: No. Mike Heyman was the first acting director for, I think, three years, just after he came back from the Smithsonian secretaryship, and then Karl Pister for two years. There's a period of five years of acting directors. Neither of those two were interested in that being their livelihood. That's the difference with respect to me. Paul came to me and tells me about this, and says they think maybe they should go in a different direction—look for an experienced high UC administrator

who is of a scholarly bent. Even though chemical engineering doesn't look much like higher ed scholarship. That threw the idea into my mind, and I rattled around with it for maybe no more than two or three weeks.

42-00:18:34

Rubens:

Really? I was going to ask.

42-00:18:39

King:

That seemed very good. It would build on what I knew, other than chemical engineering. It was, if you will, a nice base from which to do whatever I did. It offered a clear thing to do.

42-00:19:05

Rubens:

You also had been so involved with initiatives that were critical to higher ed, and you had given that talk on the role of the research university.

42-00:19:16

King:

Well, and it also came to mind, as I learned about this field, that most things that have a name like Centers for Studies in Higher Education around the country, or even the world, do not deal with research universities. That's what I could do. That's what a center at Berkeley is positioned to do. That was attractive. I made the arrangement that I would do this, and then there was this five and a half months or whatever after the arrangement before I got replaced at OP. I was actually identified to do this quite a while before I came here and did it.

42-00:20:07

Rubens:

You hadn't promised Jeanne a trip around the world?

42-00:20:15

King:

We took a ten-day trip, in between, to the Southwest. We went to Sedona for the first time, and a few other places. That's what we did. It was only a ten-day period. We even got invaded by one of the farewell events associated with my leaving the provost position. We drove our car to Las Vegas, flew back to Oakland and rented a car for whatever I had to do here for the last two or three days, and then flew to San Diego for this final COVC dinner, and then flew back to Las Vegas and picked up our car and paid the parking bill, and headed to Sedona. That's what we did.

42-00:21:10

Rubens:

We shouldn't neglect, then, what the farewell was.

42-00:21:14

King:

Oh, there were lots of events like that. I thought I had a very good relationship, and it was a warm relationship, with the vice chancellors and spouses. It was a very nice dinner in San Diego, from which I have

about ten photographs, all pinned on my bulletin board over there in my Gilman Hall office. Very warm and very nice. Just fine. Anyhow, I had agreed to do this long before I could do it, which gave Karl a problem, because he had some messes going on at the center to deal with, and when was it that I could come to relieve him? What I decided to do—first of all, there was a normal 43 percent limit on recalls. I figured I'd better abide by that. Since I had a relatively good retirement setup because of having been provost and having been at UC lots and lots of years, I thought I shouldn't try to milk the system in any way. In fact, with what was going on with San Francisco Chronicle and other papers, I should err in the direction of being squeaky, squeaky clean on what I would do. We settled on a 33 percent recall for what has turned out to be a fulltime job, directing the center. The idea was actually to try to give other people involved with the center some recognition that I was under the same pressures as them, that I could go up to 43 percent if I got the additional 10 percent out of a project—project funding rather than state funding. This, incidentally, is going to present a problem for the center whenever I leave, because there isn't a full director's salary in the center's budget.

42-00:23:18

Rubens:

Just to clear my mind, what was John Douglass's actual position, then?

42-00:23:24

King:

John is a senior research fellow. In Mike's time, for something like one or two years, he was an assistant director of the center.

42-00:23:35

Rubens:

By the way, we ought to mention where the center was located at the time, since it was a unique structure.

42-00:23:53

King:

Oh, yes. Well, a delightful location. South Hall Annex, a building which you cannot go and see today because it isn't there anymore. South Hall Annex was a one-story building, the interior of which had been designed by Martin Trow for the center, when Martin took it over in 1978. It was designed with a large conference room, almost exactly the same dimensions of this room we sit in here.

42-00:24:28

Rubens:

Big enough.

42-00:24:30

King:

A big table in it, and very small offices surrounding that conference room. The idea was that this would create incentive for people to come together in the conference room and have lots of discussions. That was one of the issues I encountered upon getting to the center, was that South Hall Annex had problems. The problem was that John Galen Howard, who did indeed design it as a temporary building—John

Galen Howard's version of a temporary building—the building sat in a sump. There was this concrete basin that was under the building, and it had been surrounded by concrete, one way or another. Since it was built, I think 1916, that concrete had broken up. Water got into the sump. Here's that water, just sitting and standing there, with all the supporting girders of the building, rotting them away. There were places in the floor of South Hall Annex you could not step, because you were going to fall through if you did. That got worse and worse during my first few years there. We finally had to come to grips with whether the building would be repaired or taken down. To repair it, the only way to do it would have been to lift the building up with a crane, create a new foundation, lower the building back down, at a cost of some exorbitant number of dollars per square foot of building occupancy. The decision, which I concurred in, was made to take the building down. That's why we are now in Evans Hall. It was the move from there. So yes, it was South Hall Annex that I went to, which actually had its own personality.

42-00:26:27

Rubens:

It had charm.

42-00:26:28

King:

It did have charm, and [a] very, very central location. Which is why it appealed to Martin and it also appealed to me. The basic question we had upon knowing we would have to move was, did we want to keep the center centrally on campus, or did we want to go to someplace like the Anna Head School, which would be three, four blocks off campus. There's no question about that. You have to be central for this to work.

42-00:26:59

Rubens:

How did you go about educating yourself to what the center was about and what you would do?

42-00:27:21

King:

I had left myself sort of a blank, open arena with regard to what I would do. I've tried various things, and I've ended up where I've ended up with regard to what I do. The broad, not very deep thought upon going to the center was, well, I do know a lot about higher education. A lot of it for California and UC, but some of it national and international. It didn't bother me at all that I was an engineer and the other people would be social scientists, because I did have this thought right from the beginning that the pitch on this place should be the research university, and so the engineer or scientist is very well positioned to understand the research university. I liked that part of it. I became acquainted with what everybody was doing at the center. Quite frankly, the center had suffered from not having a real director for a number of years, and, in a sense, was a whole that was less than

the sum of its parts, or certainly no greater than the sum of its parts. Everybody was doing different things and the synergies weren't there.

42-00:28:37

Rubens:

How big was your staff, about, then?

42-00:28:40

King:

It's about what it is now. If we define the staff as the actual employees of the center, paid employees—and it isn't that. It's wider than that. But if I take the paid employees, there are three senior researchers, who are John Douglass, Diane Harley, and Anne MacLachlan. There is a person who has been here longer than I have, and for all intents and purposes is permanent, and that's Pat Pelfrey, who was supported entirely by extramural funds from the Koret Foundation, and more recently from the Atkinson Family Foundation. That is the professional staff, in addition to the director. Then there are the support staff. As I came in, there were three of these people: Meg Griffith, Nathalie Lajarige, and Jennifer Dawson, who did the accounting. We used students as receptionists and sort of general factotums. That position has subsequently become a staff position, and it's Christina Herd now. So it's a small staff.

The issue surrounding the center, one way or another—there are many issues, but one that I saw early on, and which was not a new issue, was where are the Berkeley faculty? This center is on the Berkeley campus for a reason, which is the Berkeley faculty. Otherwise, it's in Bakersfield or Fremont or somewhere. It doesn't matter. So, how to get good bonds and ties with the faculty? If you looked at what the faculty involvement was, it was all emeriti at the time, and it was emeriti who liked seminars, or would come to some. Patricia Cross still does—a higher ed person from the School of Education, who had retired before I got here. So there are emeriti who have had the sort of career that I've had, or else are scholars of higher ed—

42-00:31:14

Rubens:

Neil Smelser.

42-00:31:15

King:

Who had joined us. Neil was former director. Good example. It has been difficult to bring in the active, un-retired faculty, so I set that as a goal. I started by having thirty or thirty-five lunches. I became very well-known in the Kerr Dining Room of the Faculty Club. I just did it with different people. I had a good rolodex coming into the position. I knew lots of people for one reason or another, and so I started having lunch with a lot of people. People like Bowker and Smelser and Pister, but also people who were active faculty, and I could see them as at least somewhat close to higher education. I found out their interests. I discussed the center. What I was really fishing for was where do I have

the possibility of bringing in some genuine research faculty involvement into the center. One of these lunches was, of course, with Martin Trow. More than one of these lunches were. He offered me the advice that this isn't going to work. You're not going to get faculty involved. In a sense, the Trow model of the center had been different. It had been a center where Martin was the director, and certainly the principal intellectual, and the rest of the center was just sort of built around Martin's interests. Well, I wasn't going to be able to do that.

The reasons I felt faculty involvement was important were several. One was the one I said, that there's got to be a reason for being at Berkeley, and surely it's the faculty. The second is that storms will come and go for the center, and you better have some real respected faculty on campus who believe in you and your mission, and can support you when a storm arrives in the form of a review or a budget cut or whatever. Whenever they want to slim down. It was important to get faculty really involved. That is still a challenge to me. But the thing I came up with at the time was the area of what we've since called scholarly communication. It derived from the fact that the library costs of universities have escalated hugely over the years, that the capabilities of information technology are at hand and offer some ways of dealing with this.

The reason I found faculty interest in this subject was quite interesting. It was because, in my last year at the office of the president, we had had a very public negotiation with Elsevier Corporation, with regard to what is known in the trade as the Big Deal. Capital "B," capital "D." The Big Deal is the pricing arrangement that these mega-publishers have for creating licensing or use of material relationships with the universities. I found, in fact, people who had written papers on the Big Deal, and I found Dan Rubinfeld, who had been in Washington, in the Department of Justice, considering whether the government should sue Elsevier after Microsoft. There were a lot of raw ingredients there. The fact that we had gone through this rather public negotiation was a big factor. It's interesting that the negotiation became public, because one of the mega-publisher's constraints in these negotiations is you may not say what price you settled on with them for the material. Berkeley cannot tell MIT, cannot tell Ohio State, what price they settled on. This, of course, leaves all the universities in the dark and subject to the mercy of the negotiations.

What happened within UC is that we were going to take a stance with Elsevier that the price of this next big deal must be lower than the last because of the budget situation of the university. You can't do that without consulting with the senate committee on the libraries and the division councils of the campuses who are going to be affected by whatever happens. We had to let these bodies know that we were

doing it. What then happened was a number of activist movements on campus, such as resolution by the Santa Cruz division advising the members of their senate not to publish in Elsevier journals because of their pricing practices. Then several quite prominent faculty at UCSF became big on the national scene on the same issue of exorbitant prices from mega-publishers. With that, Elsevier stock started to go down, the value of the stock, which caught Elsevier's attention. That's what I mean by a public negotiation. The fact that all of this was going on was written up in places like Science Magazine and the Chronicle of Higher Education. So it was quite well-known. The various division senates had taken on the issue one way or another. I come to Berkeley and I talk to people, and I talk about various topics. When I bring up this one, I find the faculty know and care about it.

That's what led me to go the direction of scholarly communication as a project we would try to get. Now, it happened to be rather close to the interests of Diane Harley. She's an anthropologist and had worked on the factors that cause faculty, especially in humanities and social sciences, to be receptive or non-receptive to the use of information technology in the classroom. Information technology and the capabilities of information technology were a big factor here. Diane and I started off on a big project. I think I got a planning grant from the Mellon Foundation, on which I was the PI. That was a little one, \$50,000 to get us going. Then we went in as co-principals on a much bigger Mellon Foundation grant that was \$400-500,000. It lasted two years. It got stretched out a little beyond that and we ended up doing a quite large project on scholarly communication. Now, how about the Berkeley faculty? That was the reason for getting going in this. We did create an oversight committee of involved Berkeley faculty, including several people who really came into this. This would meet three or four times a year. I had hoped would lead to some faculty running their own research on some aspect of this issue through the center, as a means of getting research support. It didn't happen. Nobody jumped into the pool that deep. They stayed at the advisory committee level.

42-00:39:38

Rubens:

You weren't pulling teeth to get people on the oversight committee?

42-00:39:41

King:

No, that was pretty easy. I had very, very good people. Dan Rubinfeld, who I'd mentioned. Aaron Edlin, who's a professor of economics and law. Ben Hermalin, who is economics and business. Nick Jewell, who was there not because of his professional background, but who had been deputy provost on the Berkeley campus, and who had been a principal in the formation of something called the Berkeley Electronic Press, which is an electronic publisher, and so was knowledgeable of that end of it. And some more than that. I had Dan Greenstein from the

office of the president, who had oversight of the eScholarship initiative at the time, as well as the California Digital Library. It was a very, very good group, and full of ideas. Another was Hal Varian, who was the founding dean of the School of Information, an economist of information, and who is now the chief scientist of Google. So it was a very good group. My longer-term goal of drawing these people into the center, so that whenever the day came that I would leave, there would be faculty right there who said, yes, my home is the Center for Studies in Higher Education, and therefore there would be a pool of such people for new director. There would be a pool of such people to speak for the center, if the center ran into budget problems or whatever. That really wasn't realized, and I haven't realized it since. I also had to leave that project [scholarly communication] before it was done, because I became acting director of the Hearst Museum, which left me no time to do projects. That's the way I started at the center with regard to what I would do and be involved in. I would find a project that would be of interest to me, where I could contribute, and where that project would draw in Berkeley campus faculty. That was the first effort.

My second effort was on the subject of engineering education. I have, over the years, become more and more convinced that engineering education has to move the professional degree to the graduate level, and get many more elements of a liberal undergraduate education into the undergraduate degree. A model for that is pre-med education, which does that. There are required courses for medical school that you take as an undergraduate, but you get a degree in just about anything that the College of Letters and Science or the rest of the campus would offer, and it still works for you to go to medical school. I've been quite concerned on that issue for years. I think the times call for it. Engineers cannot be monolithic, uni-dimensional nerds, but need to have a lot of the working knowledge of the rest of the world. Politics, law, economics, et cetera. Public policy. It's just called for by what the issues and problems are within engineering, in the world today and tomorrow. And also called for by the fact that the entry-level engineering jobs are going overseas. That's been a concern for some years, that a lot of the entry jobs go to India and China. When you find your software isn't working right and you pick up the phone to call for help, you're very likely to get somebody in Bangalore. That's one of the jobs that has moved overseas. There are a lot of those jobs. To contend with that, the U.S. has to create a different engineer, and one that can try—if we try to keep the U.S. as the hotbed for technological innovation, and that's our cachet and our thing we can do, we have the ideas, we develop the new products, the new processes, et cetera. Then you need a still more capable engineer, with broader knowledge, and that also calls for this transition of the professional degree at the graduate level.



There are other people, including highly placed people in the U.S., who believe in this. However, the movement is nowhere near being able to achieve its goal, largely because engineering degree structures and curricula are determined by the faculty at a particular institution, and undertaking a big change is about the last thing they would like to have on their list of what they must do. So it's been an issue. I started off putting a group together, a group that was both Berkeley and spread around the country. I had, as participants in this, Karl Pister, who feels the same way; John Prausnitz from the College of Chemistry, who feels the same way and is a member of two national academies; Bill Wulf, who, at the time, was the president of the National Academy of Engineering, and in the longer run is a University Professor of computer science at the University of Virginia; Jim Duderstadt, former president of the University of Michigan, who has an operation somewhat like what I'm in here, but he calls it the Millennium Project, but works very heavily with issues of higher education at Michigan. So he's part of it. Then I had Norman Fortenberry, who was the executive director of the Center for Advancement of Scholarship in engineering education for the National Academy of Engineering, and I had Kyle Vanderlick, a chemical engineer from Berkeley who had a very successful career at Princeton. She is now the dean of engineering at Yale. So that was my group.

We first tried to get foundation grants on this. No foundation would admit to covering the area as an area of interest. Then I went to a National Science Foundation proposal and put that in. Peer reviewed, et cetera, et cetera. I believe we suffered from the fact that 90 percent of the engineering world doesn't believe in this yet. So no NSF grant. I've been stalled since then, although I've been writing on the subject, and I just had an article that—what I did was to recover what I thought was the golden, beautiful prose from the NSF proposal, and manipulate it in three free days I found at the end of the month of August, while we were over in Mammoth Lakes this summer, and turn it into a paper that I could post in our Research and Occasional Papers Series here on the CSHE website. I did that, and it's posted, and it's been there. Then I thought, I should take the next step, so I sent it off to Jack Lohmann, who is the editor of the Journal of Engineering Education, which is the big journal in the field. I had picked up a recent copy and saw he had a guest editorial written by some people from—I think it was Boeing. I said, gee, this isn't a research paper. This is an advocacy paper. But maybe you'd like it as a guest editorial. He said yes. It is now going to be a guest editorial in next January's issue of that journal. That's what I've been doing in engineering education. If the time appeared, I would like again to get this group together. What I really wanted to do with the group is plot a cabal. That is, how shall we go about getting this change made in the U.S.? The most recent paper, by the way, makes the point that the rest of the

world is making this change before we do, because of the Bologna Process.

42-00:48:32

Rubens:

Let me interrupt you for a second. I think Emily will have some unpacking questions, specifically about this. Will it be okay, next time we see you, to take up the Hearst Museum and then—

42-00:48:58

King:

I believe we can interrupt this at any time to do the Hearst Museum. There is one more thing I myself had tried to do with the center that I will eventually want to get to. That's the public university question.

42-00:49:20

Rubens:

Emily is going to be having some specific questions to unpack about some of this, when we see you next, after you're back from China. What is the reason you're going to China?

42-00:49:59

King:

The reason I'm going to China is my one remaining chemical engineering consulting effort. I am on the advisory board to something called the National Institute for Clean and Low Carbon Energy, which is a national laboratory effort in China. No doubt with efforts to try to trumpet this effort to show that China is concerned about carbon control. This national lab is unusual in another way. It's run by the world's largest coal company, Shenhua Coal Company. That's not what you do in the U.S., is have a coal company run a national lab on clean energy, but that is what they do in China. I'm on that board both because of the chemical engineering background and the fact that carbon capture is a big part of this, and that's separations, but also for my national laboratory experience.

42-00:51:11

Rubens:

You haven't been on it that long.

42-00:51:13

King:

I started that last February, I think, was my first meeting.

42-00:51:18

Rubens:

We will get to that when we talk about some of the consulting that you've done.

42-00:51:27

King:

Let me do the public university question next time, though, because that's the other thing I've tried to do at the center. I think that's the issue of the day. There's just no question about it. Success, for me, would be to get six Berkeley faculty members, not retired, interested in one or more collaborative projects on the future of the publics.

42-00:51:54

Rubens: It could yet happen. The visiting scholar program, was that existent or—

42-00:51:58

King: That existed. I really just maintained it. I value it. I think it's very good.

42-00:52:04

Rubens: The Leadership Academy. You developed that.

42-00:52:08

King: That's an interesting story. We need to do that and the Berkeley Institutes on Higher Education, which are different. They're very pragmatic. They're how I balance my budget here.

42-00:52:21

Rubens: By the way, all of this, these first few years, these particular initiatives you were talking about, you are working fulltime, but you're being paid part time?

42-00:52:34

King: The one adjustment of my working life to retirement and fractional recall has been to sit in front of the computer at home on Fridays, rather than to sit in front of the office computer. That also lets us take longer weekends at the Sea Ranch, such as this one.

There's a question of just what level you want to operate at. It's not only a matter of getting captured into a full life without having realized it was going to happen. You know what's going to happen.

42-00:53:19

Rubens: It just seemed like a seamless shift. We'll talk about the Hearst Museum when you're back.

Interview 20: November 7, 2011

Audio File 43

43-00:00:05

S. Redman: All right, my name is Sam S. Redman. Today is November 7, 2011, and I'm in Berkeley, California, sitting down with Dr. Jud King. Today is session twenty of your oral history, part of a much longer oral history interview on his very interesting life and accomplished career. As a historian, one of my primary interests in the history of anthropology—and in particular, museum anthropology. The main thrust of the story we'll be talking about today is the Hearst Museum here at UC Berkeley, and institution where Jud King served as interim director between 2007 and 2009. Jud, I'd like to begin our conversation today by stepping back and asking you a few questions about museums growing up. In particular, you had discussed a little bit about growing up as a high school student in Washington, D.C. and first experiencing the Smithsonian. Do you recall what that experience was like?

43-00:01:05

King: Well, it was a grand feast is what it was. The Smithsonian, I rapidly discovered, was full of all sorts of interesting things. I would go there. I would go there with my parents often. If we had visitors or friends I might go with, I would frequently do that. Of course, there were many different parts of the Smithsonian. There was the Arts and Industries Building, which now lies empty, over on the south side of the Mall. There was the Museum of Natural History, botanical garden, and some others like that. The big, new Museum of American History hadn't been built yet, but there was plenty to do and see. I'd had some background before that, because junior high school had been in the Boston area, in Belmont, Massachusetts, and so there was the Peabody Museum of Harvard and the glass flowers and all of that. I was an enjoyer of museums as a visitor.

43-00:02:04

S. Redman: Now, you were particularly interested in the natural sciences and other types of sciences. Were you drawn at all to the anthropology displays at either the Peabody or the Natural—

43-00:02:18

King: Actually, probably I was drawn more to the history-oriented displays and things that might have to do with the political history of the U.S. Just in terms of where my own interests ran, it was more in that direction. Less in rocks and stuffed animals, which one might say would go with science. I do remember that everything that was crammed into that old building right next to the Smithsonian castle was what was of most interest to me. Interestingly, it was history and

political history I was interested in, more so than either anthropology or the natural sciences.

43-00:03:04

S. Redman: Let's jump a little ahead in time. Let me ask just for a moment about the National Zoo. Was that a staple as well?

43-00:03:11

King: Oh, yes, that's out of the Smithsonian, and yes, [we] went there.

43-00:03:15

S. Redman: That's a little further afield than the National Mall, but it's still right there in D.C.

43-00:03:19

King: Yes, it is, right there in Rock Creek Park.

43-00:03:25

S. Redman: Let's see. I'd like, then, to jump, if it's all right, to your time in Berkeley. I understand when you would have first arrived as a faculty member, Kroeber Hall would have been a fairly new building.

43-00:03:37

King: Yes. That's hard to believe, looking at it now. Maybe that says something about how long I've been here. Yeah, that was one of my discoveries when I started to work with the Hearst Museum, was that that building had been relatively new when I got here.

43-00:03:56

S. Redman: Many of the luminaries of an earlier era of anthropology at UC Berkeley—the museum would have been called the Lowie Museum for—

43-00:04:06

King: Yes, it would have.

43-00:04:06

S. Redman: A large portion of the time that you've been at Berkeley, and then Kroeber Hall obviously being named after Alfred Kroeber. Were you sort of aware of that legacy, vaguely?

43-00:04:17

King: Yes, I was aware of it, actually, in a couple of ways. The Ishi story is one that I hit on to early on, and so I learned about what had gone on there, and Kroeber's role. The time of the change in name, from Lowie to Hearst, I believe was during my time as provost for professional schools and colleges on campus. Since that was a complex issue when that occurred, that was something I had some familiarity with by virtue of being a high campus administrator.

43-00:04:55

S. Redman:

That's a great topic. I'd like to ask you about that, because all that I've heard of that, I believe, is really just rumor and speculation. The idea that, on the one hand, intellectually, Lowie was never really a museum anthropologist. He was a very accomplished anthropologist and ethnographer. Even though he spent time at the American Museum of Natural History and then here, he was never really identified with museum anthropology the way some other figures had. On the other hand, Phoebe Hearst was the earliest and most significant benefactor to that museum, but I've also heard people insinuate that maybe there was some hopes that the Hearst family would continue to support the museum with fundraising and things of that nature. Can you clear that up for me?

43-00:05:50

King:

I have no real insight into that question. I suspect that would have been an issue, but the issue never came right before my face. I can't say in any knowledgeable way how much of an incentive was associated with that. I would say this. In hindsight, given what I now know after my two years of working with the museum, I think the Hearst name is very appropriate—the Phoebe Hearst name.

43-00:06:20

S. Redman:

I'd like to step back for a moment. Tribal activism becomes central to the story of museum anthropology in the 1990s, but I'm wondering if various members of the campus community connected. For example, the occupation of Alcatraz Island and Native American activism in the late 1960s and early 1970s. To what extent were people in the campus community aware of these events and following these events as they were taking place?

43-00:06:46

King:

I think people were generally very aware of them. They were well-covered in the newspapers, and we all read the newspapers. I was quite aware of them. I knew something about the issues at play there. Of course, when I got to the museum, I actually worked with some people who had been involved in that occupation.

43-00:07:10

S. Redman:

Oh, is that right? Okay.

43-00:07:12

King:

Yes indeed. Our repatriation coordinator, Anthony Garcia, had started off that way. I was certainly aware of the issue, although it was not top on my list. Here I am, a chemical engineer, sitting in Gilman Hall on campus, with lots of students, lots of research, and lots of things to do. One does tend to look inwardly.

43-00:07:34

S. Redman:

Certainly. This is, again, another question that's outside of the scope of your field, and I would not be surprised at all if this is something that you weren't aware of at the time, but I understand that in the 1970s, the anthropology department was becoming particularly active in sending graduate students off to do their fieldwork, and they would come back with collections. There was a very active period around Ishi's lifetime of collecting for the anthropology collections. But then again, in the 1970s, I understand, there were a lot of collections arriving at the museum.

43-00:08:14

King:

Yes. It's interesting. To the extent I know about issues like that, I know it because of the hindsight that I learned in my two years of being associated with the museum. The way I would characterize my getting into the museum, or my situation upon becoming involved with the museum, is that I knew just about nothing at all about that museum, about anthropology, and about the current issues. That is why I have often used the descriptor that coming into that museum as interim director was like jumping on a speeding, runaway freight train with no engineer on the train. I am the engineer, and the train is charging down the track towards a bunch of switches leading off in different directions, and you have to learn as you charge down the tracks. That was essentially the position I was in for the museum.

43-00:09:11

S. Redman:

Let's lay out just a little bit of that history. In 1990, there was a major piece of federal legislation, called the Native American Graves Protection and Repatriation Act, or NAGPRA. The initial passage of the legislation called for, the first five years, that museums were to catalog their collections, and in particular, to try to identify tribal origin of any artifacts or sacred burial goods or human remains that were from—it was specifically Native American tribes in the borders of the United States, and Hawaii, and Alaska. There was a five-year period in which museums were supposed to catalog their collections, and then, I believe, maybe a three-year grace period after that. This would have been between 1990 and 1995, then maybe into '96, '97, '98. My understanding is that, whereas many other museums had electronic catalog records, the Hearst Museum, being so poorly funded, was behind in terms of its ability to catalog. There were some internal discussions about the tribal origins of certain collections. Sort of this murky period of time, I understand, that there was a lot of contention at the Hearst Museum in those first years.

43-00:10:47

King:

There was. You are correct that the records were not digitized. The records are still not fully digitized. The funding has not been there to do it. They are becoming better digitized, but they're still not fully

digitized. The project did start about four to five years ago, which is late in the game. So yes, it was a very difficult thing for the Hearst Museum to do its inventory. It has a huge collection. Very, very large. Actually, when you look at the amount of person power that was put onto the inventory project, it's impressive, and the university did spring extra funds for doing that. But nonetheless, it was a slow thing to do. I think many of the issues that I dealt with had their start with the slow inventory.

43-00:11:47

S. Redman:

To what extent do you think the slow inventory played a role in the early sort of tensions in California? It seems to me, in particular, that a lot of the Hearst Museum's struggles have been with tribal relations, with tribes particularly in the state of California. That's a unique situation in some sense, whereas the Field Museum in Chicago, or the American Museum of Natural History, and certainly the Smithsonian, have collections of human remains from all over North America. Certainly the Hearst Museum does as well, but a lot of the collecting, a lot of the history of anthropology coming out of the Hearst museum, was focused on California.

43-00:12:30

King:

That is correct. I believe the figure is something like 35-40 percent of the human remains in the possession of the Hearst Museum are Bay Area, a lot of them Ohlone. Yes, very much California. I think the other thing to throw into the picture is that California is a very different situation from the rest of the country with regard to what tribes there are, and the organization and types of these tribes. California has a continually changing number of federally-recognized tribes, but 108 in my time was a good approximation to the number. That's a lot. You go to some other states, for example, when I learned about Arizona, that has a far smaller number of tribes, and much bigger tribes. So California has several features. One is this very large number of individual tribes, all different from one another, with a tendency to have relatively poor relationships one tribe to another, which is interesting, and complicating certainly. The second thing for California is a very high proportion of the Native American population is not affiliated with tribes. Slightly over half was the number that I learned when I went in there. The 108 tribes were maybe 49 percent of the Indian population, and here were the other 51 percent not in any federally-recognized tribe. Since NAGPRA treats federally-recognized tribes and unrecognized tribes very differently from one another, in a very black-and-white fashion, that was a great complicating factor. Since there is no federally-recognized Ohlone tribe, and a high proportion of these remains were Ohlone, one way or another, this meant that a high proportion of the human remains holdings of the



Hearst Museum were not for federally-recognized tribes. That complicated matters considerably.

43-00:14:56

S. Redman:

This would put the University of California at a crossroads, even in 1990, where it had a choice, I would imagine, of either you follow the federally-mandated law, or you establish relations with tribes and potentially return artifacts, even beyond the letter of the law.

43-00:15:20

King:

Well, yes, and I think that's an important distinction to draw as we go into this. In fact, let me make another observation, which draws an even greater distinction. That is that Stanford was in possession of a large number of Indian human remains. They returned all of them before NAGPRA, and therefore in a legal climate that didn't have NAGPRA. The University of California did not do this, and even if the University of California had somehow decided it wanted to return every set of remains it could, NAGPRA would preclude that—does preclude it for the unrecognized tribes. So there is a complication. You've just set the stage for something that I think we'll refer to quite often during this. The law of NAGPRA says you must do this, and further interpreting the law, you could do this. So there is what you absolutely have to do to be legal, and there is what you could do further without becoming illegal. The position of the Hearst Museum as I came in was back at this first point. They were doing what you had to do to be legal.

43-00:16:46

S. Redman:

Now, can you explain for me, potentially, any of the background there? I understand that justification was buttressed on an intellectual idea of protecting these collections, in particular for osteological research and physical anthropology. There's a strong tradition of that at UC Berkeley. The eyes of many physical anthropologists have turned away from the racial classification theories that a lot of these early collections were born out of, towards human evolution and a longer scope of research in Africa, in Asia, and human origins in particular. Nevertheless, a lot of scholars on this campus who are primarily identified with those types of research—by that, I mean in Africa, searching for human origins—were still intellectually quite defensive over what they viewed as an important osteological collection. We can get into that in a little bit, but were you ever approached by curators when you first started, saying, we need to defend this collection?

43-00:18:08

King:

Oh, sure. I think it's important as we come into this to recognize that NAGPRA itself is a compromise, and it is a compromise between the interests of museums and physical anthropologists on the one hand,

and the Native American tribes on the other hand. NAGPRA gives you a legal structure, both for what you can do and how to do it, but also for what you can't do and what are the rights of museums. There is most definitely a national lobby of physical anthropologists that engages with these issues. During my time, there was a draft set of regulations for interpretation of NAGPRA with regard to the unrecognized tribes that was put out for comment. There were a number of organized bodies from the anthropology side that presented commentary on this draft language, and then, of course, commentary from the Native American side. You're correct that there are organized groups on both sides of the issue with regard to NAGPRA.

43-00:19:32

S. Redman:

On the other hand, maybe complicating matters a little further, is that there are members of the anthropology department here that are quite active in their opposition to the work of physical anthropologists, even on this campus. There's a pretty diverse anthropology department here.

43-00:19:47

King:

It's a very diverse anthropology department. It has, for years, had the reputation of being ungovernable because of that. It's a very special case. There was also a break within the anthropology department, where some of the osteologists, physical anthropologists, left the department. Tim White, who is a very prominent name here, is a member of the department of integrative biology, not of the department of anthropology. That was by choice.

King:

Pardon?

43-00:20:28

S. Redman:

Do you recall when Tim—

43-00:20:29

King:

Well before my time. I can't pin down a year for it.

43-00:20:35

S. Redman:

I hate quoting lengthy quotes here, but I'd like to quote from a press release, if I may. This is the release that announced when you were appointed interim director of the Hearst Museum. This came from the office of Beth Burnside, who's the vice chancellor for research, or who was the vice chancellor for research. This is in reference to you assuming your position. "His appointment is for a period of transition, during which he will facilitate and oversee these conversations, as well as planning for the expansion of the Hearst Museum's exhibition space, appropriate locations for its holdings, fundraising, and development efforts, and assurance of the effectiveness of the museum's activities and mechanisms for tribal visits, interactions with

Native American communities, and processing NAGPRA-related requests and repatriation.” Can you tell me a little bit about these duties as they were first described?

43-00:21:31

King:

Yes, I can tell you about the duties, but I think it’s probably also important to give some background as to why that was the list of duties at the time.

43-00:21:42

S. Redman:

Maybe we can talk a little about the initial conversations about your possibly becoming the interim director.

43-00:21:49

King:

That’s a good one. Those occurred along about the 25 of August, in 2007. It happened to be the week after I had just returned from our annual week-long trip in the Sierra, and so I was feeling like I could conquer the world and life was great. It was clearly the best timing of all for the university to approach me then, rather than some other week. So I got this call from Beth Burnside. Actually, she had called, I think, while I was in the mountains, and so I was supposed to return the call. She told me a little about the situation and indicated that they felt they needed a senior person with a wide understanding of the university, and the abilities to work effectively with people and achieve ends in harmonious ways, to do this. As she talked, I became intrigued. I knew very little, as I said, about the Hearst Museum, or about anthropology for that matter, but it was clear that they had a situation that was very public and very much in a high rolling boil with regard to everything that was going on. Demonstrations, charges, accusations of the chancellor, et cetera. So I felt, okay, if the university thinks I can do this, and I think I agree—I probably am one of the few people who can do this—and if they want me to do that, I’ve had forty plus good years at Berkeley and with the University of California. If that’s how they would like me to repay for some of that marvelous opportunity, then, okay, I’ll repay. It was agreed that I would come on very soon after my return. I think I had about two weeks of being able to learn something about the museum. Talking to the deputy director, for example.

43-00:23:55

S. Redman:

So this is Sandra Harris at the time?

43-00:23:56

King:

That’s Sandra Harris. Kent Lightfoot had been the director, but with the difficulties that had gone on—and we’d better talk about what they were—with the difficulties that had gone on, Kent Lightfoot had been put in an exceedingly difficult position, and had obtained agreement that he would leave the directorship. So in fact, Sandra Harris was

running the museum before I came into the picture. Kent is himself a very prominent anthropologist, and much of his research focused on the Fort Ross area in California and the Kashiya Pomo up there, where one of the tribal groups that was particularly vocal about the museum as a result of a situation that had developed, and so he was put in a situation where his research was not doable because of the break in relations.

43-00:25:00

S. Redman:

Kent Lightfoot is a California archeologist. He's in the department of anthropology, but he's also a curator of the California Archaeology Collections. He's appointed director, and he has, in some sense, this conflict of interest between his own research drive and the—conflict of interest might be a strong term, but there's a potential conflict there between his own need for archeology—

43-00:25:28

King:

So there was for any director of the Hearst Museum, I think. Of course, I was totally different in that way. The previous directors had all had that situation to one extent or another. I don't think Kent was actually subject to bad results from a conflict of interest. I think the problem was more an intense and very personal attack on him as well as the chancellor, and as well as Beth Burnside, and just not being comfortable enough with administration to want to come forward and deal with those things in difficult ways. Instead, what was his desire, as I sensed from him, was to get away from that and make the number one objective to repair the relationships that would enable him to do his research. In any event, he wasn't there.

43-00:26:42

S. Redman:

He was gone by that time. Your first two weeks of coaching, I assume a lot of that came from Sandra Harris, the deputy director.

43-00:26:49

King:

Yes, that's correct.

43-00:26:53

S. Redman:

When you had arrived for those two weeks of coaching, I believe what had happened over the course of the previous year, things that you mentioned there, was there was an attempt to restructure the NAGPRA process at the Hearst Museum. On the one hand, the university portrayed this as a normal restructuring effort. That there was one retirement, one person was being let go, and everyone else was simply changing position.

43-00:27:38

King:

I do think there's more to it than that. It has to do with how the NAGPRA oversight office had been set up and how it had functioned over the years. There was originally a period of time when the

NAGPRA office reported directly to the vice chancellor for research rather than to the director of the museum. This was to try to make it very visibly clear that the NAGPRA function was independent of the museum. That was during the inventory time. Then, later on, it got put back with the museum, and had been that way for a number of years before I got there. It had nonetheless operated as an entirely separate office, in ways that were at least confusing and at most detrimental to the operation of the museum. For example, the NAGPRA office had its own inventories that were different from the museum's inventories. The NAGPRA office had its own pencils, its own papers. Everything was separate. As a result, when we have looked back on the inventories of the museum and the NAGPRA office, they would be different. Now, which one is right, and which one is going off to Washington in the report to National NAGPRA? There was a feeling that it would work much better if there was one set of records, and an integration of the NAGPRA function into the museum. The university side was actually presented as the need to have everybody in the museum aware of and involved in NAGPRA compliance, rather than it being separate, outside the museum. The most concerned people within the NAGPRA office were of the opinion that this was the university trying to stop the independent functioning of the NAGPRA office.

So this reorganization had been done, and I think it was actually implemented June 1 of 2007. It did involve the person who had been acting director of the NAGPRA office no longer being so, and that was very upsetting to that person. That person, being Native American, was then able to express this displeasure to other people in the Native American community, and a campaign had started to get tribal resolutions opposing the reorganization of the NAGPRA function. About eight of these resolutions had been gotten as of when I came on board. So that was happening. There were also op-ed pieces, National Public Radio interviews, et cetera, that were quite condemning of the university, all of which was orchestrated by an activist group that had, and I think still has, its own website. I haven't checked in the last four months, but the last time I looked, it did. Both the chancellor and the vice chancellor had gotten into the act.

43-00:31:16

S. Redman:

One of the things that you had mentioned was that there was a personal appeal here to Chancellor Birgeneau as a member of a First Nations tribe in Canada. A lot of what I'll call rhetoric, but also you could call activist efforts, or protest efforts, referred to Chancellor Birgeneau as a member of a First Nations tribe. In fact, one of those op-ed pieces said, well, he should start acting like an Indian, because he is one. Did you have any sense of whether or not that affected him at all?

43-00:31:57

King:

That affected him greatly. He felt he was very improperly and unjustly accused in those various things, and that his Native American heritage was not only something of personal importance to him, but it was indeed personal. To have that being dragged out there in these accusations was very uncomfortable for him. He therefore had not been willing to meet with activists who, in various public ways, tried to have a meeting with the chancellor. That's quite understandable. The thing that brought negative implications against the vice chancellor for research was different, and an example of something that can happen in this electronic age. There had been an email sent to Vice Chancellor Burnside by—I think it was an eighty-year-old member of a tribe, a woman, on the subject of whether or not there would be Native American members of a particular review committee chosen by tribes, as opposed to being chosen by the university. They were urging her to do this. She then chose to forward this email to the associate vice chancellor for research, Bob Price, with the simple words, "No way do we do this," except she hit reply rather than forward. So this went back to the woman in the Indian tribe and got spread throughout the tribes, and they made great hay out of that. Those were among the things that were creating large difficulty at the time. There had also been demonstrations outside the museum on the subject. The return of remains is a very sensitive subject to tribes. I discovered they have very different feelings from tribe to tribe on this. Entirely different. It is, however, a subject that tribes can get together on. I think the situation can be understood by this being a way to get tribes that are often unfriendly together on an issue, and also, if you want to talk about the practical politics of it, a way for people to run for tribal office. It's a good issue, that the museum should be returning remains.

So all of that was involved in this and going on. I picked up maybe 5 or 10 percent of it during my two weeks of preparation, and then found myself on the train. Well, so, what am I supposed to do? I'm supposed to bring reason to this situation, calm things down, and get good policies and policy interpretations in place. Let's talk about that end of it before we talk about the development and more display space end of it, and why that was in the package. I think it's better to separate these two topics.

With regard to the hubbub, it became very apparent to me, as I was talking around to all sorts of people, that there was just not enough genuine communication and display of concern to the tribes—that the museum held back. It wasn't something the museum leadership was accustomed to doing, and so it was quite apparent that the very first thing I had to do was get out there and talk with people. There was a meeting on some aspect of NAGRPA down in Palm Springs early on.

That was probably a week or two after I got into office, so, okay, let's go to that meeting. On the program for the meeting was a session that had been generated by the activists, which had a title, something to the effect of, "How Lousy is the Hearst Museum?" That session had been put together without any interest in museum people being part of it. So we went, we attended. We also indicated that we would be present in a room in the evening, when there was nothing scheduled, for those who wished to come and hear what we had to say about the situation.

43-00:36:48

S. Redman: Was this you and Sandra Harris?

43-00:36:51

King: It was me, Sandra Harris. Actually, there was a threesome that went out to these, and four of went to Palm Springs, including Sandra Harris, Anthony Garcia, Natasha Johnson; Garcia had participated in the Alcatraz occupation, and who had been a member of the NAGPRA office. Of the five members of that office, he was one of the two that simply bought in to the reorganization, stayed with the museum, and never got attached to the objections. Then the director of that office, or the acting director of that office, was, as I indicated, the person very much agitating. Another member of the office had had a temporary appointment, which had ended. The third one, I think, just simply retired. That was Otis. One of the Kashiya Pomo. I'm blanking on the last name. I went with Sandra and with Anthony, and, I think, with Natasha Johnson, who was the other member of the former NAGPRA office.

43-00:38:19

S. Redman: These are individuals with years of NAGPRA-related experience. On the other hand, this is your third week.

43-00:38:26

King: This is me, brand-new. Well, I had one big aim at that meeting and in other meetings that came along, and that was to show myself to be interested and concerned and trying to understand, and able to take sort of the engineer's explanation of things that would recognize both sides of the issue, and give my interpretation of NAGPRA and what it enabled us to do and what it did not enable us to do. So that happened early on. That was, I think, a good meeting, although there were some people who took quite vocal stances against the museum at the meeting. Two members of the piloting group of five people that was overseeing the activist effort.

So having done that, the next problem was, okay, there are 108 Indian tribes, they're all separate in California, and they constitute slightly less than half the total Native American population. I want to get out there and talk to people in the Indian world. How do I do that with that

kind of situation? What I hit upon was the idea of regional meetings. Sandra and Anthony and I would go and just be there for I think it was three hours, starting with a lunch, at each four locations around the state. The first one of these we did, I think, in December, in Santa Rosa, and the second one of these was also December, in Reno, which is not California, but is near a lot of California Indians. The third one of these would have been January and was up in Redding. The fourth was in Palm Springs. Trying to cover the state. We sent out invitations to all 108 tribes. We put the announcements in various media that we would be there. Anyone designated by tribes was welcome to come. We invited tribal leadership, and the tribes could define what leaders. There was an effort made by the coalition, as the activists called themselves, to try to discourage attendance at these meetings. That was interesting as it went along.

I think in Santa Rosa, we had about twenty people. We held that at the California Indian Museum in Santa Rosa. It's in the same building as the National Indian Justice Center, the head of which is Joseph Myers, who comes into this picture very prominently as it develops. We did the one in Santa Rosa with the twenty people, and I remember Joe Myers sitting up on a raised platform behind me, watching the whole thing to see what happened. Obviously, he was saying, who is this guy and how is he going to handle this? Joe is a UC person in many ways. He's a lecturer in Native American studies. We now have a Joseph Myers Research Center over on the Bancroft side of the campus. That one drew about twenty [people]. One of the twenty was a lawyer for a tribe. Turned out to be the Dry Creek Pomo, which is a very well-to-do tribe. They have the Cache Creek Casino. The lawyer bore in with a whole lot of questions.

Then we went to Reno, and we had maybe another twenty. One of those twenty was from the tribe that the lawyer had been from, and had conversations with us afterwards—Dry Creek Pomo—and indicated that he had asked his lawyer to go to the first one to size us up, and he decided now he would come to this one. That tribe was one of the eight that had passed a resolution against the museum, that was posted on the website of the activist coalition. This gentleman, as the Reno meeting went on, decided that he'd been hearing a very small part of the story from the activists, and actually got that resolution withdrawn and became a substantial supporter as things went on.

The third one of these [meetings] was in Redding and drew seventy-five. A way to characterize a Native American community of California is that, as you go from south to north, the temperature gets higher. The level of emotion gets higher. The Redding one had about seventy-five people and was a very intense and difficult meeting. Logic didn't get very far. Emotion ruled the day. I do have a memory



of one particular episode where a woman, I believe from the Pit River tribe, stood up in the back of the room and said, "Mr. King. Mr. King, you look like you're over seventy years old. Mr. King, you don't have long to do the right thing. You need to do it now. Now, Anthony and Sandra, sitting on either side of you, they're young. They've got a lot of years before they have to do the right thing, but you have to do the right thing right now." I managed to show no emotion one way or another on my face for that one, although I found it highly entertaining. That was an example of the sort of thing that was coming forward in that meeting. A host of Indian issues came forward, and not just the repatriation.

Then we went to Palm Springs. The attendees there, who must have been another twenty or so, really weren't interested in waiting until the end of lunch. Let's just start talking business now, as we started into lunch. I might as well have been meeting with the board of U.S. Steel. It was an entirely different conversation, all very businesslike and practical, and I think reflects that enormous difference between the situations in the north and the southern part of the state. The southern part of the state has relatively few tribes, big casino operations, and they are very much in the business.

Another word on the casinos, and then we can go onto the next question. The casino issue was very much a part of this. The situations differ greatly from tribe to tribe, but the other thing that had happened is that the coalition had put their issues into the governor's office. At that time, the governor was extremely interested in using increased casino revenues to the state to balance the state budget. So there was concern from the governor's office, who wanted to keep the tribes feeling right about this. I think the governor's office eventually saw this difference between the northern and the southern tribes, such that the ones they were most dependent on for income weren't that much concerned about the issue, and the ones they weren't dependent on for income were very concerned about the issue. So it changed the nature of the politics in Sacramento once that was realized, I think. Anyhow, that's the way I started off. Meeting with a lot of people.

43-00:46:53

S. Redman:

With these four meetings, there were certainly some emotionally-charged moments where you had mentioned that logic and reason had sort of taken a backseat to some of these people. In large part, they have reasons for being upset, and there's a personal attachment to it. There's a frustration there that's understandable. Were there intellectual critiques of the way the reorganization unfolded that were founded?

43-00:47:31

King:

It's interesting. The reorganization almost never came up. The issue was the return of Native American remains held in the Hearst Museum. Probably we need to get into the record here that there are about 12,000 sets of human remains, most but not all of them being Native American, highly concentrated towards California and the West. It is the second largest collection in the U.S. beyond the Smithsonian Museum of Natural History. The numbers are big and it catches a lot of attention. The issue at all of these meetings was the return of the remains. If you look at how the activist part of the concerns had developed, what happened is that the people who were concerned about the reorganization, in order to get bulk and mass to their effort, linked with the issue of the return of remains. There developed a coalition, most of whom had the sole issue of the remains rather than the reorganization. That becomes important later on, in April, when we get to what happened then.

43-00:49:32

Rubens:

Just for purposes of clarification, the impetus for the reorganization, who is really driving that?

43-00:49:43

King:

I think the interests were those of Burnside, Price, and Lightfoot. So the vice chancellor for research, the associate vice chancellor, who was the one who had principal responsibility for the museum, and the museum director.

43-00:50:02

Rubens:

Was the NAGPRA section being paid for by the federal government, or did it come out of university budget?

43-00:50:10

King:

It came out of university budget, but it was a separate item in the university budget. The museum has the museum budget and the NAGPRA budget. The NAGPRA budget was put there when NAGPRA came into being, and was a very large budget all while the inventory was going on, and then became a smaller budget. Although I believe the two items are still separately budgeted, just because the campus hasn't changed. The NAGPRA operation went back into the museum, was diffused more widely throughout the museum. But we were very careful that the percent of anybody's time we put on the NAGPRA budget was indeed at least the percent of their time they were spending on NAGPRA matters.

43-00:51:07

Rubens:

This is university money, not federal money?

43-00:51:08

King: Yes, that's correct. NAGPRA is an example of an un-funded mandate in that sense.

43-00:51:17

S. Redman: If the University of California did provide the funding initially for NAGPRA, and the primary directive, initially, was to complete those inventories, why did the Hearst Museum so uniquely struggle with completing that task compared to, say, the University of Michigan or—

43-00:51:35

King: Because its collection is very large in comparison to other museums, and because its records were mostly written rather than digitized. Those are the two reasons.

43-00:51:48

Rubens: Was there any Academic Senate committee, even ad hoc, that was involved.

43-00:52:00

King: Very little Academic Senate involvement or interest. There is another actor outside of the Berkeley administration, and that's the system-wide administration, and a system-wide NAGRPA committee. This is worth going into. This was one thing that I think caused special concern out there in the Native American community. The process was this, that a tribe would have to express interest in the return of something, and then they would work with the museum to develop a claim. That claim would then come to the campus NAGPRA committee—and we need to talk about that. Then if the campus NAGRPA committee believed that it was appropriate for return under NAGPRA law, then it went to a system-wide NAGRPA committee, which was in existence to try to hold common standards and decisions among all ten campuses of the university. All ten campuses do not have human remains, however. The number having remains is much smaller. Then that system-wide NAGPRA committee would have to decide positively and recommend repatriation to National NAGRPA, who could, and sometimes have, said no themselves to the repatriation. Now, come and look at this from the standpoint of somebody who is in the Native American community and wants to facilitate return as much as possible. It looks like they're having to jump three hurdles rather than one. So that was a difficulty, that perception.

43-00:54:05

S. Redman: Certainly different from the way a major natural history museum, like the Field Museum or the American Museum of Natural History in New York, would have it structured. There's no system-wide NAGPRA committee. You're just dealing with—

43-00:54:18

King:

So that's another thing I did early on, was start learning about and visiting museums. We went up to the UBC museum in Vancouver and learned about their operation. They're not under NAGPRA, so it's a different legal situation, and the First Nations structure in Canada is different from the structure in the U.S., but nonetheless, that was a very useful visit. I went to Washington and added onto a meeting I was in Washington for already, a National Academy of Engineering meeting, a day to visit the new Museum of the American Indian, and also to talk with the repatriation people from the Museum of Natural History. I found them to be totally different from one another. I found the nature of and what was done by the Museum of Natural History was very similar to what existed at the Hearst. They have research, they have professional researchers on the staff, and that fact is reflected in their collection policy and policies for return. They are very different from the new National Museum of the American Indian, which I would say is more pro-doing whatever you can for the Native American community. An important thing at the new National Museum is the fact that all tribal relations are integrated in together with NAGPRA activities. I recognize that as being very useful, because your NAGPRA relationships with tribes, the best you're going to do is come out looking okay. You're not going to look good, no matter what you do on NAGPRA, and you can look very bad if they petition for a return and you don't return. Other tribal relations can be quite positive for tribes, and so getting the two together was obviously a very good thing to do. We did that at the museum, and actually hired a tribal liaison officer as one of our recruits. So I went to those two museums. We had also learned extensively about the Field Museum in Chicago. Then the other that we tried to learn about, but unfortunately the director passed away as this was going on, was the State Indian Museum in Arizona, which is at the university but is a state museum. All of these were to find out what others are doing with regard to the situation. I was invited to give a lecture on separation processes at Yale, in New Haven, and took advantage of that opportunity to go see the person doing this at the Yale Peabody. So there's another one. So learning from museums, trying to learn what were the feelings out there in the Native American community, and then the third part of this problem was how to make the relationship with the chancellor better.

43-00:57:57

Rubens:

So there is no federal money,

43-00:58:04

King:

No federal money. It's an un-funded mandate. Like so many of the California ballot propositions: this must be, but we don't give you any money to do it.

43-00:58:16

Rubens: Does it matter how people are chosen to be on the UC-wide system?

43-00:58:20

King: Oh, yes. That's a change I made. That was my biggest and most difficult change.

43-00:58:25

S. Redman: Okay, we'll get into that.

#### Audio File 44

44-00:00:04

S. Redman: We've been talking about the impact of his time at the Hearst Museum, and in particular, working with the issues surrounding the Native American Graves Protection and Repatriation Act, or NAGPRA. Jud, in the interim, we talked about the restructuring of NAGPRA committees, and in particular, I'd like if you could parse out for me campus NAGRPA committee versus UC system-wide.

44-00:00:43

King: The campus committee that I inherited was one composed of anthropologists, and had had on it a Native American member, but that person had retired and so was gone. That committee works by meeting with the repatriation coordinator of the museum, which was an open position at the time that was being recruited for. The chair of the campus repatriation committee, for years, had been Tim White, an extremely distinguished physical anthropologist who, in fact, the very year I was dealing with this situation, came out with the discovery of Ardi in Ethiopia, and became Science Magazine's scientist of the year.

44-00:01:58

S. Redman: World-renowned scientist, but in California, he is renowned, in some sense, as being the chair of the NAGPRA committee at UC Berkeley.

44-00:02:10

King: That was well recognized. Believe me, that was something I heard often in these regional meetings that we held. Tim is a very assertive individual and would make his views and his feelings on the matter quite well-known. Example, I mentioned earlier the comment period on this revision in the interpretation of NAGPRA that had been put out by the NAGPRA office for comment. Comment number one on their website was from Tim White. He took that kind of prominent role. This, to those concerned in the Native American community, looked like the fox being put in charge of the henhouse. Seemed to me pretty blatant, too. It spoke to the values of the university on judging the sides of this issue. I came to the conclusion that the campus NAGPRA committee had to be reconstituted, and that we would do a couple of

things. We would put on it some expertise that was other than anthropology, but was expertise about Native Americans. That we needed a chair who would appear to be, and be, more impartial than the appearance given by the leading physical anthropologist being on it.

For a chair, after much deliberation and seeking and talking with Beth and with Bob, we went to Phil Frickey, a professor of law, one of whose fields was Indian law. Well, NAGPRA is the law that you're dealing with, so that seemed to be a very reasonable appointment for a chair. Phil was wonderful about this and really threw himself into it in an extremely difficult period, because Phil Frickey knew when he accepted this that he had a cancer that was probably untreatable. He did pass away a year and a half later after taking this on. He was excellent at this. His successor, and again this was my find, and Phil's recommendation—Phil and I would talk very openly about his disease—his successor was Dick Buxbaum, who has something like a fifty-year Berkeley career. He is still active, even though he's over eighty years old, and quite active. He had grown up adjacent to an Indian reservation in New York. His family had fled Europe from Hitler. His father was a medical doctor. The one medical doctor job that his father could find was a reservation in upper New York state, and so they lived not on it, but adjoining it. Dick had a lot of interaction with the tribe as he grew up. That gave him an understanding and a way to be able to show his understanding and concern to the Native people. The Indian law person was the chair of the reconstituted committee.

44-00:06:00

S. Redman:

Did Tim White—

44-00:06:01

King:

Tim White remained as a member. Of the remaining members, half were physical anthropologists, and that was White and Kent Lightfoot. Three of them, Ira Jacknis was the third, and then Frickey, and then I need two more: they were Joe Myers, keeping it to Berkeley people, and Joe was a lecturer at Berkeley, and Karen Biestman, who is both a Berkeley and a Stanford person. She's on the Stanford law faculty but teaches in American studies here at Berkeley. She is Native American, and also, twenty years ago, was the associate dean of students here at Berkeley. That was my repatriation committee. Tim White did not like the idea. He brought it to—I'm sure -- the chancellor, who managed to get it back down to the vice chancellor, and so I got invited by the vice chancellor to what turned out to be a three-hour meeting.

44-00:07:19

S. Redman:

With Tim and the vice chancellor?

44-00:07:20

King:

With Tim and with Beth and Bob Price sitting there, as if to sort of judge the issue after hearing from us. The idea, of course, is that Tim wanted me overruled on this. Beth and Bob were not faithful attendees throughout the three hours. They drifted in and out, and there I was the whole time with Tim White, going back and forth. So the decision held. Maybe Tim understood a little more about why the decision—

44-00:07:54

Rubens:

He was willing to serve on the committee once he was demoted?

44-00:07:56

King:

Yes, yes, yes. His relationship to the museum, I do not know firsthand now, but my impression from the director and from a couple of others I've seen there is that it's quite positive.

44-00:08:12

S. Redman:

There are two other prominent members of the department of anthropology who figure into this in very different ways. Nancy Scheper-Hughes has been an outspoken critic of collections of human remains, and then also, I imagine, Laura Nader.

44-00:08:34

King:

I never dealt with Laura Nader on this, and she was not vocal on the issue.

44-00:08:39

S. Redman:

Can you speak, maybe, perhaps, about Professor—

44-00:08:41

King:

Nancy Scheper-Hughes did have strong interest. She, too, is a rather assertive individual, along with Tim White. We had a couple of difficult episodes there. One was where she came when I was in a meeting of some kind in the museum office and wanted me immediately. I went out in the hall, and she had with her the representative of one of the Alaskan tribes, the Tlingit. It turned out that that person was about to go speak on the Sproul Hall steps with Nancy Scheper-Hughes, and the thing to be gotten out of having seen me was that they had talked to the museum director and gotten nowhere, except they didn't present any request or demand to me, but never mind that. So that was one issue. Another was certain tribes, when they came on repatriation issues, the contact had been made by the tribe with Nancy Scheper-Hughes. This was quite difficult for my museum people, Bradley Marshall, who was the tribal liaison, and Anthony Garcia, who, at that time, had become repatriation coordinator, because they were, in effect, doing dealings with Nancy Scheper-Hughes and her people that properly should be done with the repatriation coordinator of the museum. There were a couple of very difficult episodes there.

- 44-00:10:16  
S. Redman: Did you get the sense that Anthony Garcia and Nancy Scheper-Hughes had known of each other's existence, or was this a breakdown in communication, or was this an intentional—
- 44-00:10:28  
King: I think it could have been anybody else in the repatriation coordinator position, and it would have been the same.
- 44-00:10:41  
S. Redman: Is there anything else that you'd like to say about the restructuring of the campus NAGPRA committee? Go ahead.
- 44-00:10:47  
Rubens: What about the role of Native American studies here at campus?
- 44-00:10:51  
King: That's another person I consulted with, was the man whose name I'm going to have to look up, who is the head of that.
- 44-00:10:57  
S. Redman: Tom Biolsi?
- 44-00:10:58  
King: Yes.
- 44-00:11:00  
S. Redman: I'd like for you to speak about Tom.
- 44-00:11:09  
King: Well, it's simple enough. I did not ask Tom to be on the repatriation committee. I didn't see a reason to. I simply used him as somebody I could talk to, to try to get insight into what was going on.
- 44-00:11:24  
S. Redman: Would you mind if I ask what sorts of things did he share with you? Did he share any special insights into these issues?
- 44-00:11:31  
King: Well, yes. I think his view of what was driving this, what needed to happen in order to calm it, et cetera, these were all useful things.
- 44-00:11:42  
S. Redman: He's a very measured individual. He's obviously an extremely sharp intellect, but he's highly regarded with the Native American community as a scholar and an individual. He seems to me a good person to talk to about these issues. Was that the case?
- 44-00:11:59  
King: That's exactly why I went to him.



44-00:12:01

Rubens:

My question really was, politically, or in terms of public relations, you didn't feel you needed a rep from the Native American studies department?

44-00:12:11

King:

I had one. Joseph Myers.

44-00:12:18

S. Redman:

Are we sort of clear, then, do you think, on the restructuring issue?

44-00:12:21

King:

Yes. That was an important step towards settling the waters here, but an even more important one involved the relationship between the chancellor and the tribes, or, maybe better put, how the activist tribes would perceive the chancellor.

44-00:12:42

S. Redman:

These relations had been damaged by some of the accusations that had been made towards the chancellor, and in particular, the Daily Cal reports suggest that there had been some very prickly email exchanges that were using language that the chancellor had felt to be uncomfortable, so he had kind of wanted to meet with activists.

44-00:13:05

King:

That was one thing that had concerned him, was the nature of language in the emails. The other thing that had happened is that, after my regional meetings, and as I started into the other ways of trying to calm this, the activist group did get to one of the state senators, who held a hearing in Sacramento, and then a press conference following the hearing. This was all done in a pro-activist way. Senator Flores from Fresno, if I remember correctly. This consisted of an hour of various leaders of the activist group testifying openly before the committee, then an hour that consisted of Beth Burnside and me, neither of us being allowed to make opening remarks, as it happened, the entire hour of the other side of the story. Then for most of the time during our hour, the subject was Beth Burnside's unfortunate email that I described earlier. That then ended with a press conference and a request by the senator that the chancellor meet with the activists. At that point, the chancellor pretty much had to meet with the activists, but we were also able to devise a good way of doing it, and this is where Joseph Myers comes very much into the picture.

The idea developed is the chancellor would host a two-hour luncheon at University House on a particular day, and he would meet with fifteen or sixteen Native American leaders from around the state, some of whom were the activists. There were about four of the activists in this, and a number of others who were just well-recognized citizens, including, incidentally, Joseph Myers's half-brother, who is Larry

Myers, who now is retired, but at that time had, for about twenty years, been the head of the principal Native American-oriented office of the state government, the California Native American Heritage Commission. It was a good group and good conversation. Something else happened in connection with that, that was not designed by me, but which was very helpful, which was that we had invited these leaders, and of course none of them was of the activist from the museum. The decision had been made that these would be people outside the university whom the chancellor was meeting with. The activist from within the museum, the one who had been concerned about the loss of position in particular, petitioned to join this lunch, or was going to walk into the lunch, and that was brought up with the activist leaders from outside the university who were involved in the lunch, and they made the decision that the issue of the repatriation of the remains was so important that it was reason enough to hold the lunch by itself. They themselves were sufficiently comfortable with the UC people being left out of it. That forged a split between the two issues, and was quite vital that way.

44-00:17:02

S. Redman:

This, in a sense, then, becomes less about the restructuring and more about a general request for information about repatriation.

44-00:17:13

King:

The whole subject was repatriation. In early April, it was decided that, in July, there would be a second meeting. As of that July meeting, we had the re-composition of the repatriation committee to report, we had our tribal liaison officer and the work that he was doing, and some other good things, too, to report. The interesting thing about the July meeting, interesting to me at least, since the first had been held on the chancellor's territory, the second one was to be held on Indian territory, and so it was at the Indian hospital in Santa Rosa. Invitations had been extended to all of those who had attended the lunch at the chancellor's house, and only Joe Myers, from among those people, attended. Twenty other people attended, who hadn't been invited and who also represented portions of the Indian community, but the issues had gone away. In effect, the fact that the attendance at that second meeting was so totally different from that at the first meeting reflected the fact that the leaders of the repatriation movement had moved on to other things. Now, why had they? I think the reason is, A, the chancellor having done what he did, and B, the fact that we had very visibly moved from doing just what we absolutely had to under the law, to most of what we could do under the law. I believe that was perceived and accepted, and that is what put it to rest.

44-00:19:04

S. Redman:

A big issue. If you could give me just a little insight here as to Chancellor Birgeneau's—I got the sense from just reading about this

issue that—and then you had mentioned he was very deeply hurt, personally, about some of the accusations. Do you think, eventually, he was able to calm those nerves a little bit and move forward, or do you think, many years later, there's still some hurt feelings?

44-00:19:41

King:

I do not think it's a happy episode in his book of episodes. It was clear to me that he was very inwardly affected by all of this the first several times I met with him on this. You can see that. You just felt it was too personal an attack.

44-00:20:08

S. Redman:

Do you feel like that played a role at all in that meeting with Tim White and Beth Burnside about the restructuring of the campus NAGPRA committee? Do you think he still had some sort of personal feelings about that? You'd mentioned that the bulk of that meeting was between you and Tim White.

44-00:20:28

King:

I think that meeting occurred after the April luncheon at University House. Going through that luncheon at University House was a very helpful thing.

44-00:20:43

S. Redman:

That was a big moment.

44-00:20:45

King:

Because the others behaved civilly towards him.

44-00:20:56

Rubens:

Could you talk about the extent to which Birgeneau did rely on you?

44-00:21:05

King:

Heavily. Every time I see him, he comments on it.

44-00:21:12

Rubens:

You took a lot of heat –of course you were experienced with that. You became the target. The university counted on you to handle that.

44-00:21:23

King:

Yes, I think that's a correct diagnosis.

44-00:21:29

S. Redman:

I'll ask one final question in particular on NAGPRA, and then we'll return once more to human remains when we talk about the Japanese skeletons.

44-00:21:43

King:

The maybe-Japanese skeletons.

44-00:21:47

S. Redman:

We recently witnessed the twentieth anniversary of NAGPRA, and a lot of the essays that appeared in print this past year argued that NAGPRA has, overall, become a much more collaborative process. Given the Hearst Museum's very unique relationship with NAGPRA, and the landscape that you encountered when you entered, it seems to me that that would be a simplistic portrait of NAGPRA that, in 1990, was maybe contentious, but the way a lot of scholars write about it is that, oh, by 2010, now museums and tribes have these great relations.

44-00:22:24

King:

I believe that it is still perceived as an overly cumbersome, drawn-out process, and difficult process for the Native American tribes. After all, they are not scholars. They have to make a case to a group that includes scholars. They've got all the evidence that says that there is affiliation of these remains, or this basket or whatever, with this tribe. They have to do that. Then there's a NAGPRA committee which may or may not be trusted by them, which has to approve it at the museum or at the university, and then it goes onto a national committee, which also has dual composition, anthropologists and Native American leaders. It just looks darn difficult, and, if you will, the deck stacked against them can be the perception. I think that is still there. In dealing with that, I think it is important that museums and universities do what they can to make this more workable. Now there is a change as a result of this proposed change in comments and issuance of the policy. There is a change which provides ways for unrecognized tribes to get returns. When we were approached at the museum by one of the several contending Ohlone parties, the Amah Mutsen from the Hollister area, for negotiations regarding returns despite the fact that they remain unrecognized—they've got one jump, still, to go to get recognized—I felt we should go into conversations with them. If we developed something that was appropriate for return, then use the changed law to do it. That's something we didn't have to do, since they're an unrecognized tribe and are not supposed themselves to be able to negotiate with us. I looked for things of that sort, where we could show that we were being closer to the what-we-could do fence, rather than to the what-we-had-to-do fence.

44-00:24:54

S. Redman:

Continuing with the train analogy, the speeding train of tribal relations at the Hearst Museum, where do you think the train is going?

44-00:25:05

King:

I think improvement is still the vector. When the museum finally did get a director to replace me, Mari Lyn Salvador—she is a person who has played very well with tribes in tribal relations. I think the nature and attitudes and reaching out of the director, or other high people in the museum, but preferably the director, is very important towards

this. The tribes appreciate greatly seeing that somebody cares about them and their interests.

44-00:25:49

S. Redman: You've spent a career centered on issues of intellect. This was a political issue that had both—

44-00:26:00

King: And moral.

44-00:26:01

S. Redman: And moral. This has an issue of legitimate intellectual concerns, but then there are also religious, spiritual, ethical, moral concerns, as well as, as you've seen, emotional concerns. Can you maybe put this into a little bit of context for me in terms of the entirety of the NAGPRA experience versus what you had experienced up to that time?

44-00:26:32

King: I think to throw me into the NAGPRA situation back when I was an associate professor wouldn't have worked at all. What the NAGPRA/Hearst Museum/tribal experience traded on within me was all that I'd gotten out of the years of administration and the various, myriad different situations I had been in. In particular, some knowledge of how to deal with people, how to read the person on the other side of the table and their interests, and make sure you're doing what you can to make it a positive healing experience rather than a disruptive—

44-00:27:13

Rubens: The whole affirmative action—

44-00:27:16

King: That would be a good example, wouldn't it? That was another speeding train.

44-00:27:29

S. Redman: Are you comfortable with transitioning to expansion? The Hearst Museum—Burton Benedict once noted that it had the largest collection per smallest exhibit space of any museum in the country.

44-00:27:46

King: I believe that. I never heard that quote from Benedict, but I believe it.

44-00:27:53

S. Redman: It's renowned for having this absolutely massive collection of not only human remains, of course, but material culture—

44-00:28:00

King: All kinds of things.

44-00:28:01

S. Redman: From around the world.

44-00:28:05

King: Many other Indian artifacts, too.

44-00:28:07

S. Redman: That's right, that's right, and a very modest exhibit space in which to show this.

44-00:28:11

King: Modest indeed. Five thousand square feet.

44-00:28:14

S. Redman: Can you talk a little bit about efforts to expand—

44-00:28:19

King: This, I think, is the issue. That, in a sense, the Hearst Museum is the classic old research museum. It's a collection of objects that are very useful for research, and a huge collection of them. But the layman thinks a museum is a place you go, like me and the Smithsonian during high school. The Hearst has very little of that. Since the collection is anthropological and actually includes such things as remains, there can be very intense concerns about the treatment of the material. Then, on top of that, you have the fact that there are 108 different tribes with 108 different views on how human remains should be handled. The rules with regard to access entry and handling and studying of these remains, you have to have a set of rules, but not all tribes are going to agree with whatever set of rules you have. It's a hidden museum. Therefore, I felt intensely during my time there that the thing that would help it most would be getting much more display space, becoming a destination for people who visit the Bay Area—one that they would value. It would be one of the top nine or ten things to do. It certainly has the collection to enable that. But very little attention had been given to the display, and in fact, as I came into this, I would hear some things that told me there was a contention between those who wanted more display and those who felt that more display would harm the research function of the museum. So there was even an issue as to whether more display was desirable. To me, it was immensely desirable as a way of developing a community, being appreciated by people out there, and then, when we go the next step towards development, having a constituency that appreciates you and loves you, probably because of the viewing as much as any research you're doing. That, then, is your potential donor community. That all made a large amount of sense to me.

The question of facilities and display came back to me in another way, which was that the campus wanted to make the decision that they would hold off a director search until there was some sort of

satisfactory answer in hand with regard to the facility situation. The facility situation was being driven not just from the standpoint of more display space, but also from the standpoint that the major storage area, the Marchant Building down on Folger Street in Lower Berkeley, had been sold and was to be vacated. This was an interesting situation, where the decision to make the sale was apparently made independently of programmatic concerns. The decision had been made that the university would acquire, and did acquire, the old Price Club in Richmond, to the north of the Richmond Field Station. What was stored in the Marchant facility would be stored there, which is further away. So if you take something as simple as taking a class down to the storage area to see something, that worked in Lower Berkeley. That—

44-00:32:17

S. Redman: In Richmond.

44-00:32:18

King: In Richmond. So there were issues there. Yeah?

44-00:32:24

Rubens: How does it come about that that kind of decision is made independently?

44-00:32:30

King: Because the real estate people are here, and there are eight different kinds of program people who interface one way or another in the facility.

44-00:32:41

Rubens: So they just don't talk? There just isn't—

44-00:32:43

King: They don't talk enough.

44-00:32:46

Rubens: Related to that, you said campus wanted to hold off the directorship—

44-00:32:51

King: I meant, by that, Beth Burnside.

44-00:32:54

S. Redman: It seems that the real estate folks might not have quite an understanding of the enormity of the task of moving an anthropology collection from one place to another.

44-00:33:04

King: Well, there is that, too. That was thrust upon us. Given all that was in the Marchant Building and the nature of it, yes. The packaging and the move, my goodness, is an absolutely enormous issue. This ended up with an arrangement being made for the Hearst Museum to stay in

Marchant space, with some things that we did not want to move either because we needed the proximity or the difficulty of the move. I don't know if this is still true today, but well after my time, the Hearst Museum was still using rental space in the Marchant Building, which engendered another problem, because the university had removed security personnel from the building. So how did we get security?

44-00:33:59

S. Redman:

With priceless artifacts, that's a major concern. The plans, as I had heard them, were that the desire was to expand the exhibit space out towards Bancroft Street, but using the existing museum.

44-00:34:22

King:

Actually, when I came onboard, there was a study going on which would do that, but that would acquire relatively little new space. To do the job as seen at that time, you would also have to take the parking lot and the tennis courts to the west of Kroeber. That was a situation where the use of that space for a building was in the long-range development plan, but wasn't in the desired, soon-to-do plans of the campus. That was impractical. It then also became a matter that to do the whole job working with a bigger Kroeber Hall would create much too large an envelope of Kroeber Hall. The problem I was presented with was that we needed to find space that would work for exhibition, storage, and vacating the Marchant Building, and wanted to have that in hand as a doable plan when we would hire a new permanent director. I don't think that's necessarily the best plan for the museum, what we ended up with, but it was a viable plan.

44-00:35:57

S. Redman:

I know across the street—

44-00:35:58

King:

Yes, that's what we ended up with. There is this long-term project to move the Berkeley Art Museum to a new location on the site of the old printing plant of the university. You have, in the old building, a very interesting situation. You first of all have a seismically unsafe building. Simply put, it would be thirty-five million dollars more just to bring it up to code, seismically. If you work with that building, you have to find and spend thirty-five million dollars before you do anything programmatic. However, that building is an original work of a well-known Bay Area architect. Architectural considerations would say that it shouldn't be torn down. If the university is going to have this building and use it, what is the best use of it? I might say the thirty-five million dollars includes not just seismic renovation, but also the fact that the ramps that go from floor to floor within that building are one or two degrees more inclined than handicap code says they should be. So it's the ramps, too, and the elevator didn't stop at every floor was another part of it.



We did come up with a plan, a usable plan, that would take the current art museum building, and use its display space for display. That was, I think, a factor of five increase on the display space for the museum. That would make a big difference. The storage would be very largely in the basement of Kroeber, and the current museum space in Kroeber, display space, would be used for some other purpose. I've forgotten whether it was storage or offices. You would have the offices on one side of the street with the storage. You would have the display on the other side of the street, which engenders a problem of how do you take things back and forth across the street. That intersection, incidentally, the one controlled by the light, needs to be improved somehow. That is the most dangerous intersection anywhere in the East Bay. Possibly burrowing underground would be a way to do it. Anyhow, that was the creation of a viable plan. Now, it is also true that the museum may be able to get large donation for something else, which could in fact be a de novo construction of a museum, if an appropriate site can be found.

44-00:39:00

Rubens:

You have sat on so many space planning committees. This one, where would you rank it in terms of problems?

44-00:39:11

King:

This was a planning exercise that was being staffed by an architectural firm. I'd say it was right up there with the business school and with the Hearst Mining Building, which are probably the two most complicated other ones I was involved with. That got us a viable plan. We then started the search for a new director, and in something that's almost never done. I was put on that search committee, but that's because I obviously had no interest in continuing as director. That had been suggested to me at various points during the two years.

44-00:39:53

S. Redman:

An important point, you had mentioned—

44-00:39:55

King:

But there's a reason why I did not feel myself right for permanent director, and that is I'm lacking the programmatic knowledge. I have everything else in the way of what might be needed, but not that. That is core for bringing the museum forward, to have the programmatic, anthropologic, museum-oriented knowledge.

44-00:40:14

S. Redman:

This is why you wanted the title interim in your position all along.

44-00:40:19

King:

Remember, I had two recall jobs at this point. I'm still directing the Center for Studies in Higher Education here, which is suffering during those two years and three months, because obviously most of my time had to go to the museum.

44-00:40:34

Rubens:

Were you working out of the museum? Did you have an office over there?

44-00:40:40

King:

There's a director's office there, which is also the conference room, or was in those days. A great, big table in it, along with a desk. That's kind of awkward. That had always been built for non-resident directors. The professor of anthropology who was the museum director would use their anthropology office and come to the museum as needed, including for meetings. The library of the museum, in a sense, and the conference table took most of the office of the director. So think of this very room (that we are now in), on a smaller scale, being most of the office of the director. Plus, there's a question of how I work best. I started off trying to do mornings here and afternoons there and that kind of thing. It doesn't work, because appointments are hard to schedule, meetings are hard to schedule, and there are some meetings of people that aren't you that are in the director's office there. The museum had no administrative assistant for the director, and the center does. The center was deriving income because of my being museum director, because my salary money was still in the center's budget, but the salary I was being paid was being paid out of the museum's budget. That released money to the center. I therefore used the center office, went to the museum as needed. Got a well-worn path back and forth between Evans Hall and the museum. Just worked from here and went there when and as needed.

44-00:42:30

Rubens:

Were you doing fundraising as well?

44-00:42:34

King:

A little. To do fundraising effectively, you need the raw material for it. One thing we did was hire a director of development, a very good person, who got the museum started for the first time on real fundraising. That was the other thing about the starting point that I walked into. The development operation was just about zero. There were one or two good friends who would give some money in six figures, but nothing more than that. Here you have a museum that's named the Hearst Museum, and there's a Hearst Foundation, and there are Hearst people. It's obvious that you need to do this [i.e. development], but you have to do it in the right order. The museum has to become public, public-faced and oriented. The museum has to have a development director, who needs some time in order to do research on potential donors. The short answer to the question of was I doing development, the answer was not much, except for one or two very major visits to people who might be quite large donors.

44-00:43:49

Rubens:

Did the gift store already exist?

44-00:43:53

King:

Yes. But the museum had gone to where the store was staffed by work-study students. The price of admission to the museum is zero. The number of visitors was small enough so that it didn't make economic sense to pay somebody to sit there and take their money. That's a pretty low level.

44-00:44:21

S. Redman:

Would you like to turn next to the search committee for the new director, or would you first like to deal with—did you say August of 2009, your entire—

44-00:44:32

King:

When I left? No, August of—oh, that's—yeah. Oh, let's do August of 2009.

44-00:44:38

S. Redman:

In 2009, another issue comes forward involving human remains. This time, thanks to the web, the story spreads internationally. I was able to find newspaper articles about this from the United Kingdom. Really, the story broke from the San Francisco Chronicle. The story was of the Hearst Museum's 1974 acquisition of skulls collected by a U.S. Navy doctor from Saipan in 1945. The San Francisco Chronicle, according to my read here, broke the story, but anthropologists have known of these skulls for quite some time, having used them in studies in the 1990s, for instance. At the time, you defended the museum as providing respectful stewardship for these remains, but others disagreed, including someone we've mentioned already, Nancy Scheper-Hughes, in the department of anthropology, who called these remains "ill-gotten goods" and asked why the museum wasn't doing more to identify the living ancestors of these individuals. Can you provide me with your perspective on this?

44-00:45:43

King:

This one came jumping out of the box with no warning. Actually, it came jumping out of the box in an interesting way, because one of the big issues in the discussions with the Native American community had been that the museum was no longer collecting remains, no longer accepting them. I turned some down during my time there. The scuttlebutt I had was that it was 1970 that we stopped accepting remains. Well, here were these from 1974. This again shows the lack of good written records in the museum. You couldn't answer that question well as to when we had last accepted remains. These particular ones were willed to the museum by a person who had been a Navy medical—

- 44-00:46:36  
S. Redman: Dr. Max E. Childress, a former Navy doctor.
- 44-00:46:39  
King: That sounds right.
- 44-00:46:40  
S. Redman: He had told museum authorities that he'd collected the remains when he was serving overseas.
- 44-00:46:47  
King: On the beaches of Saipan.
- 44-00:46:50  
S. Redman: And that some bones had been from hospitals where he had worked, but others may have been acquired under different circumstances. He had died five years previously, so it wasn't a sort of situation where you could then call him up for more information.
- 44-00:47:07  
King: Some of these were even marked in the ways that bones are marked for anatomy classes, used in anatomy classes. Yes, it was a collection that came all in one group.
- 44-00:47:19  
S. Redman: He had later taught surgery at UCSF, I understand, so he had a Bay Area connection of some sort. Anyway.
- 44-00:47:25  
King: The other side of this, the other ingredient of this story that people should be aware of, is that Saipan was one of the more intense and difficult battles of World War Two. It is one that ended up with mass suicides on the Japanese side, including citizens of the island jumping off of cliffs to kill themselves at the end. So with a collection of bones from Saipan, there are all kinds of possibilities as to who it might be. It was assumed from the start by the Chronicle, on the basis of the information they had been given, that these were Japanese soldiers, but it wasn't known that they were Japanese soldiers. It was a collection of bones that had been given [to the museum]. The Chronicle pretty clearly got the information by the museum's records having been sent directly to them.
- 44-00:48:28  
S. Redman: Do you know how that took place?
- 44-00:48:30  
King: I can speculate, but I don't know how. I just know that they seemed to have what was in the museum records.
- 44-00:48:36  
S. Redman: Would you care to speculate or would you prefer not to?

44-00:48:40

King: It has to be people who want to get the museum in trouble publicly. We learned rapidly about these bones.

44-00:48:54

S. Redman: Do you think potentially the reason why this set of human remains was brought to light by an individual who would like to see the museum be in hot water for this, was this because of the claim that the museum had, that it had stopped collecting remains in 1970?

44-00:49:08

King: No, I don't think so. I think it was because bones from Saipan are relatively lurid. Now, we do know that, also, at the same time, material on these bones had been sent to other places. Again, apparently just sending the museum records. That was true for NAGPRA in Washington, and it was true for an institution in Japan. Not a governmental institution, but a shrine that is ultra-patriotic, and which—

44-00:49:46

S. Redman: The Yasukuni Shrine?

44-00:49:46

King: It maintains that it is the resting place of spirits of Japanese warriors and soldiers from World War Two.

44-00:49:55

S. Redman: So this information was sent to the shrine?

44-00:49:56

King: Probably it was sent elsewhere as well. It was from those two sources that it came—three sources, counting the Chronicle—that it came back to us. One would presume this was done as a coordinated effort.

44-00:50:09

S. Redman: Did you get a phone call from the Chronicle reporter? Was that how you'd first found out about—

44-00:50:15

King: No. They just ran a story.

44-00:50:17

S. Redman: Okay, so you were never contacted for a comment for that initial story.

44-00:50:22

King: I don't believe so.

44-00:50:24

S. Redman: Did you have a particular reaction when you—

44-00:50:27

King:

So we find out what these are, and what we have to do is see what records we have, what our records say, et cetera. This we did, to see what we had in the way of records. Eventually, and this was after my time, actually, because this occurred so close to the end of my time—no, wait a minute, I take it back. Before I left, we dealt with the Japanese Embassy in Washington. Originally, they had hoped the story wouldn't happen and would just simply not be, because they found it an embarrassment any way this would come out, and would prefer not to deal with it. We then reached agreement with the Japanese government that we would send these to a testing laboratory in [Hilo,] Hawaii, run by the U.S. Navy, I believe, or maybe another branch of the government, that is able to do DNA testing and establish the origin. Now, the report on that came back after my time. The report, I understand, revealed that they were a whole collection of all different things, mostly non-Japanese, except for two skulls. Then an agreement was reached with the Japanese government that rather than being returned to Japan, the skulls would be buried in a proper way in the U.S. The last I knew, negotiations were going on with Mountain View Cemetery in Oakland to see if they would take the two skulls. I don't know beyond that.

44-00:52:09

S. Redman:

One of the things that's noted in a follow-up article from the San Francisco Chronicle is that a whistle-blower apparently sent a phony letter addressed from you out to a number of different organizations, and specifically over to Tokyo. I wonder if you've ever—

44-00:52:31

King:

Yes, we did find that that had happened in the two cases. We don't know about the Chronicle, but we do know about the shrine and we do know about the NAGPRA office.

44-00:52:44

S. Redman:

Have you ever had—

44-00:52:46

King:

It wasn't the NAGPRA office in Washington. It was the MIA office.

44-00:52:51

S. Redman:

Oh, with the U.S. Army of Defense.

44-00:52:53

King:

That's where it had been sent to. Actually, the first I discovered of this was getting a letter from the shrine in Japan, that was written in old Japanese and had to be translated, and which said, in effect, we thank you very much for your offer of returning these remains; however we deal only in the spirits of people, not in the bodies of people, and therefore, don't send them.

44-00:53:22

S. Redman: But you had never sent this?

44-00:53:23

King: I had never sent them a letter. That was consistent with a lot of things that went on in this episode.

44-00:53:34

S. Redman: That seems a unique circumstance in terms of a university experience.

44-00:53:44

King: Yes, it certainly was unique.

44-00:53:48

S. Redman: It seems like you have a sense of humor about all of this, but did that irritate you at the time?

44-00:53:54

King: I saw it as a problem that had come up that had to be dealt with in the right way, and again, in a way that was fair and respectful to these remains, too.

44-00:54:14

S. Redman: We've talked about a lot today, about the Hearst Museum. You arrived in September of 2007, and by December 1 2009, your appointment—

44-00:54:25

King: That's when I go out, yes. That's when the new director begins.

44-00:54:28

S. Redman: Can I ask you to briefly reflect for me—

44-00:54:31

King: By the way, I was signed up for three months when Beth Burnside called me originally. It should be possible to do all of this in three months, and then it became time to set my appointment and establish the terms for it, and she said, "Well, why don't we make it six months, since that will allow for the possibility that it might go on. I don't think it will." So we went from three months to twenty-seven.

44-00:54:57

S. Redman: There are many layers of this. You're going from your initial assignment that you'd taken on to what it became in terms of a relations effort with California Native Americans, and then also working with Chancellor Birgeneau and anthropologists on this campus, on different sides of the spectrum, from Tim White to Nancy Scheper-Hughes, and then also trying to deal with the issue of expansion and storage of collections. That's a variety of issues. Could you reflecting back now.

44-00:55:35

King:

I'm glad I did this, even though it may seem strange, but it was a very interesting and broadening experience, and it also was one where I felt I could pretty visibly make accomplishment, and did make accomplishment. So it was satisfying in that sense. If it helped the campus get out of a pot of hot water, so much the better. I'm glad I did it. It was very educational to me. I had not known anything much about the Native American community before getting into this, and now I certainly do. I can appreciate their issues. I think they're very difficult issues for those people, confounded greatly by being chopped up into all these different tribes, with the difficult relationships among the tribes. It's tough circumstances.

44-00:56:29

Rubens:

How hard was it to find a director?

44-00:56:34

King:

I think if we had done the search under different circumstances, we would have found a larger pool, but we got a very good director.

44-00:56:41

Rubens:

What about the decision—was it a decision—not to have it be an academic person based on the campus?

44-00:56:51

King:

She's an adjunct professor, I believe, or certainly qualified to be one. We did not feel it was a necessity for the person to be a professor. We did feel it was a necessity for the person to be able to even up on an intellectual plane with faculty members, and our director can do this.



Interview 21: November 10, 2011

Audio File 45

45-00:00:19

Rubens:

Emily and I are going to split the interviewing today. We had wonderful sessions on your time at the Hearst Museum and I want to back up and ask you a few questions about that. But I want to even back up further just for a minute. This may seem very oddball but I wondered if your manner of dress or literally the kind of vestment that seemed appropriate for coming back to the campus was different than what you had at the OP. We could include a little history of the culture of attire from when you first came to Berkeley in '63.

45-00:01:07

King:

Yes. So those were the days where it was all coat and tie and everybody was that way. Not the students but the faculty were totally, be they assistant professor, associate professor or full professor. And then the faculty attire drifted off some over the years. But as I moved to administrative positions it remained coat and tie through my time as provost here. And then going off to the office of the president, that was a different place and the mode of dress there was suits and I had to buy some suits and wear some suits and that was what you would do for regents meetings and even for daily work at the office of the president. Coming back here, of course, by that time everybody's attire had gotten much more informal by changes over the years. And so exactly what I have on now—what is comfortable and certainly not a tie during the day. When do I wear ties? When I go to something that requires a tie or when I go to the office of the president I still feel that I should put on a tie. I think that says something about the office of the president and the relationship with the rest of the university. Really there should be some concern there. The suit dress is because of there being so many external dealings with a world that is a world of suits and so it's clear enough why that's the natural mode of attire there. You almost wear a sign on you when you meet with faculty that you're something different because here you are the suited individual and they are not. And that is something that I think the office of the president needs to worry about, is not differentiating themselves from the campuses and the faculty on the campuses if for no other reason than just a statement of what the values are, that they share common values and goals with the faculty and aren't off there devising ways to torment them with resolutions that come from Sacramento and such things.

45-00:03:31

Rubens:

I think that's an important part of cultural history that really reveals an administrative style and the culture of an institution.

45-00:03:41

King:

Well, and my administrative style has always been one that would befit more what I have on today than the suit affair. To try to be as informal as possible and put people at ease in dealing with them. It's a little different.

45-00:03:57

Rubens:

Was that an issue at the Hearst Museum, particularly when you were talking about all the state meetings and the meetings that you were having throughout the state for community—

45-00:04:06

King:

Oh, I would dress there like I did here. And, of course, the Indian community dresses in very informal ways, too.

45-00:04:15

Rubens:

So you wanted to match that.

45-00:04:16

King:

I would not want to differentiate myself more from them, either.

45-00:04:19

Rubens:

Returning to the topic of the museum - you came to that position when there was already as you said, a high rolling boil taking place and that you were asked to simmer that down and to handle it. Just to clarify, how long had Kent Lightfoot been the director?

45-00:04:58

King:

Kent Lightfoot was actually himself an acting director. And had been doing this something like two years. Maybe a year and a half.

45-00:05:14

Rubens:

And had it been Burton Benedict before that?

45-00:05:16

King:

No. There were several people in between. Rosemary Joyce was one of them. There were others. And I'm not going to be able to recite the full list.

45-00:05:26

Rubens:

It lacked a certain continuity, stability in terms of—

45-00:05:30

King:

Yes. It had always been professors of anthropology and I don't think anybody was outside that mold until me.

45-00:05:39

Rubens:

Did you know Burton Benedict, by the way?

45-00:05:41

King: I met Burton Benedict. I hadn't known him before coming into the Hearst Museum but he was a person I had an early lunch with.

45-00:05:48

Rubens: Sure, when you were trying to come up to speed about it.

45-00:05:50

King: Trying to find out what it was all about, yes. And he obviously was very knowledgeable. He's deceased now. But back as I was doing that, he was a docent for the museum. So one of the early things I did was go meet with the docents and there was Burton. He was retired.

45-00:06:11

Rubens: He was a docent, however?

45-00:06:14

King: The docents are all volunteers who lead one person or group or another through the collection at various occasions and he was a volunteer for that.

45-00:06:40

Rubens: Just for clarification, the decision to take NAGPRA from reporting to the vice chancellor of research, that had happened before you arrived?

45-00:07:01

King: Well before. I think, if I get my dates right, that the two years of reporting to the vice chancellor would have been very early on and perhaps even during the inventory period. So that points towards around the mid-nineties, whereas this was 2007 that I came in.

45-00:07:27

Rubens: The decision then to put it into anthropology, how is that decision made? Who—

45-00:07:40

King: Well, it was put back into the museum. And the museum is quite distinct from the department of anthropology.

45-00:07:46

Rubens: To the museum, okay.

45-00:07:49

King: And I'm sure that decision must have been made by the then vice chancellor for research and so that would have been Joe Cerny unless the decision happened to have been made at the point of change from Joe Cerny to Beth Burnside.

45-00:08:07

Rubens: And do you think that the boil would have been slightly less had it still been in the office of research as opposed to—

45-00:08:18

King: Oh, that's interesting.

45-00:08:24

Rubens: It's a counterfactual question.

45-00:08:25

King: Let me put it this way. I think the ingredients for the boil would have been there no matter where it reported. The specific instance that touched the boil off did have to do with the fact that it was in the museum and that the change being made was to integrate the function more into the rest of the museum. That's what touched the particular instance off. So if you look upon it as dry tinder sitting there waiting and when somebody touches a match to it—the tinder was there all the while. The particular match that set the tinder off was related to the fact that it was reporting to the museum.

Also in hindsight I do not think that the structure of having it outside the museum was good because it is more of a police mentality or a separatist mentality and in order for this NAGPRA function to work well, the spirit of it has got to be permeated throughout the museum. People have to live it, breathe it, know that the issue is there and behave accordingly. So having the NAGPRA function outside the museum removed that force from within the museum that would have enabled people to be more sympathetic and understanding of the need for the NAGPRA function.

45-00:10:02

Rubens: And then one last question particularly about NAGPRA. And it may be my lack of knowledge in just how things—

45-00:10:15

King: Took me two years to understand the law.

45-00:10:17

Rubens: Where does the money come from? That's what I don't quite understand.

45-00:10:20

King: The money. Oh, for funding the office or the work of NAGPRA. It is campus money, under the control of the vice chancellor for research. But interestingly enough, it has never been permanently budgeted. So it has to be asked for each year. And the reason for not permanently budgeting it in the first place was that the inventory work was very expensive and was all within the NAGPRA budget, so those were years of very high NAGPRA budget and then it was supposed to go back down lower, as it did, in subsequent years. So the amount of money was always changing. That would be a reason not to budget it permanently. And then by the time it got to where the NAGPRA

function was in steady state, at that point the campus was making very, very few commitments on permanent budget. So it had to remain temporary because the campus had a policy of not creating additional permanent budget.

45-00:11:34

Rubens:

But of course the mandate was there from the federal government so there had to be some allocation?

45-00:11:38

King:

Oh, yes. It's an example of a wider issue within the university which is that there have been many mandates that come from the federal government for one thing or another that don't come with budget. So when observations are made that the proportion of administration to faculty academic work has increased over the years, and it has, it's things like this that are the reason. The fact that there is a federal mandate to do something or other, be it NAGPRA, be it animal use and care, be it human subjects, review and policy, be it all kinds of EH&S rules, all of which are good by themselves but the mandates did not arrive with budgets. So that has increased the administrative burden on the university.

45-00:12:54

Rubens:

So let's talk about the budgets.

45-00:12:56

King:

Yes. So there were two things. All during my term at the office of the president, including even my year as vice provost for research, there were issues of the various pueblos in New Mexico and their relationship with the Los Alamos National Labs. The pueblos there are very old. They've been around quite a long time. And interestingly, the geography of it is that Los Alamos is the top of a mesa and down at the bottom of the sides of the mesa in many directions are pueblos. Not meaning pueblo buildings but meaning tribes.

45-00:13:36

Rubens:

Communities.

45-00:13:37

King:

So there had been concerns that there would be radioactivity in the water coming down off the mesa and things like that and was there adequate employment of the residents of the pueblos at the Los Alamos labs. So there were a number of issues there. And as we from the office of the president would go down to Los Alamos, as we often did for various needs, meetings or events, with some frequency there would be meetings with pueblo people. Some worked at the lab and you would meet them. One was a resident of the Taos pueblo who was also, I think, coordinator of Native American relations for the lab and we would talk with him some. Also I remember meeting at the San

Ildefonso pueblo with the pueblo leadership on issues pertaining to their relationship with the labs, which was revealing and interesting.

The other thing that gave me some experience with indigenous peoples and their needs and concerns was my years of—my three years of being vice chair of the Keck telescope board followed by three years of being chair of the Keck telescope board. And there the issue is Native Hawaiian people and it comes together with the telescope because the top of Mauna Kea is regarded by Native Hawaiians as sacred grounds. There had been burials up there in years long gone and other things like that. The ownership of the top of Mauna Kea lay with the University of Hawaii so the relationships, the Keck telescope people, the California Association for Research in Astronomy would have—were with the University of Hawaii as landlord and then various concerns of the Native Hawaiians. And what drew this to a head was a project that would build four so-called outrigger telescopes around the two big Keck telescopes. I'll not go into the function of the outriggers except to say that they would allow the interferometry that was done to enable the two big telescopes to have all the more sensitivity. They would enable that interferometry to work better and be still more sensitive. So this was a matter of building four smaller telescopes around two very large telescopes and there was a permitting process in that. NASA was going to be the funding entity for the outriggers because they related to studies that NASA wanted to do and NASA had become at that point one of the Keck partners with one-sixth of the role in managing the Keck telescopes. And the permitting required hearings and ultimately actions by a state permitting body, and a lot of Native American concerns were expressed during that. Many were very serious, very real and very earnest. There was also an interesting element of the use of that circumstance to gain more influence for the Native Hawaiians within the government of the state of Hawaii. So they recognized it as a good issue for that purpose, a very political purpose as well as the quite moral purpose.

So the upshot of that story, after years of negotiations, is that when the permit finally issued, as it did, that was the year NASA had a big budget constriction and removed the money from this project from the budget and the outriggers were never built.

45-00:17:54

Rubens:

And were you negotiating with this up until—?

45-00:18:02

King:

The board would be setting policy and making decisions of what to offer, what to say, maybe to hold an event relating to the telescopes and the Native Hawaiians or whatever. I was not the one out at the

various local public hearings. The observatory director did that and reported faithfully.

45-00:18:27

Rubens: Right. But by the time the permitting finally went through, were you still in—

45-00:18:31

King: I was board chair then.

45-00:18:33

Rubens: Okay. And then I think we discussed this after the tape went off. But you had been chair of the chem-e department I think when the whole issue of Ishi's brain being housed at the Hearst Museum came up, or maybe it was the Lowie Museum still. Is that right?

45-00:18:52

King: Oh, I was provost professional of schools and colleges at that time and that issue—there was by then a vice chancellor for research so that was the primary person dealing with that issue for the administration. But it was of course a complex and sensitive enough issue so that we spent a significant amount of administrative time sort of reviewing it and making sure what was being done was good.

45-00:19:20

Rubens: And the upshot was that the brain was—

45-00:19:27

King: The brain had been with the Smithsonian. But under the ownership of the Berkeley campus and so it was returned by the museum to the owners. Not returned to the museum. Returned by the Smithsonian to UC as the owner and in that way it became UC's issue. The eventual disposition was a repatriation of the brain. Now, that was an interesting one in view of NAGPRA, too, because Ishi was the last of his tribe and so the question is with whom is the affiliation. And the answer that was used was a geographic answer: the tribe next closest to the area was the one to whom the brain was returned.

45-00:20:26

Rubens: So at the time of that controversy it didn't catapult into the larger one of human remains?

45-00:20:32

King: No, not to my knowledge. The human remains issue has been there all along, of course, and must have been recognized back in the seventies or 1981, whichever is right, with regard to when the last donation of human remains was made to the museum. You may remember my interview last time, I kept finding different answers to the question of what was the last year. But that has to have been recognized as an issue at the time that decision was made.

45-00:21:09

Rubens:

But the level of outrage and the political organization—

45-00:21:15

King:

The level of concern was not as great.

45-00:21:18

Rubens:

Or the political response or the community organizations.

45-00:21:22

King:

Both. This one, again, is both moral and used politically.

45-00:21:27

Rubens:

Ok. Just an aside, are there any other similar museums to the Hearst in the UC system?

45-00:21:38

King:

Nothing of the magnitude of the Hearst. There is the Fowler Museum at UCLA which has some remains. I do not think there are other actual museums in the UC system but there are researchers who deal with remains elsewhere. I think Riverside and Davis both have those. And then, of course, there was the issue of the finding of the very old remains in the backyard of University House at San Diego. That was happening at the same time.

45-00:22:16

Rubens:

Why don't you just tell that story.

45-00:22:20

King:

So about twenty to twenty-five years ago, human remains were discovered in the backyard of University House. That is the official residence of the chancellor at UC San Diego. And they had been sent off, I think, to the Smithsonian but the way the Smithsonian did it the ownership remained still with the campus. And they came back to the campus at one point and about a year or two before I became involved with the Hearst Museum a claim had been put in for those remains by a local tribe down near UC San Diego. I believe it was the Kootenai and so they wanted return of the remains. San Diego had no other remains and so had no repatriation committee. And so they mustered together a repatriation committee rapidly. A professor of biology was the one who headed it, or was it, and I remember her calling me at one point to find out various NAGPRA related answers that I could give her.

And the story of those remains is quite interesting. They are 9,000 or more years old, so they are older than Kennewick Man, which also was a similar issue. Therefore there is a question whether you can affiliate something that's 9,000 years old with some present day tribe. So the repatriation committee at San Diego recommended against repatriation. This recommendation was sent to the chancellor, who



believed that the campus would be better served if there was repatriation and she so recommended. And so her positive recommendation went to the system-wide committee. And now this is second hand knowledge, not first hand knowledge. But my understanding is that the system wide committee also said no on the grounds of the inability to affiliate something 9,000 years old and that the president did nonetheless recommend repatriation.

I happened just this morning to have met with a good friend from the Hearst Museum and I asked him the question of what had happened there and apparently that one is still hanging. That national NAGPRA, who has to approve the repatriation, said no and sent it back with something, and I've forgotten what it was, to be resolved by the San Diego campus and it hasn't happened yet. So this repatriation still hangs eight years or so after it was initiated.

45-00:25:27

Rubens:

And the system-wide committee that you're talking about, is that the NAGPRA?

45-00:25:32

King:

That's the system-wide NAGPRA committee.

45-00:25:32

Rubens:

Advisory committee.

45-00:25:33

King:

Which is composed for the most part of the chairs of each of the campus committees from those campuses that do have remains. That's not all campuses.

45-00:25:46

Rubens:

In concluding this topic, I would like to revisit, if you don't mind, the discussion about the director of the museum not being a member of the Academic Senate. You did point out that she is an adjunct professor. That means she teaches in the department.

45-00:26:07

King:

She would be eligible to be an adjunct professor. I don't think she is. I don't think the issue has been pursued. But the director who succeeded me, the now permanent director, whose name is Mari Lyn Salvador, she's a Berkeley PhD anthropologist. So she is of an intellectual accomplishment and level to deal one up with the department of anthropology faculty and I think that's an important thing. So it comes not so much from title as it comes from how much of a researcher you are and how much of an intellectual you are on these things.

So she does not, to my knowledge, hold an academic appointment, although she may. I haven't investigated it. But at the time of her

appointment that wasn't done or sought. But she does most certainly deal intellectually with the anthropology faculty and she has done a lot with regard to program aspects of the museum, more than I could have done because it takes anthropology knowledge to do that well. But I'm on their distribution list, of course, and there are probably two or three times as many programmatic events by the museum per year as there were in my time. And that's good.

45-00:27:34

Rubens:

Yes. I raise this not to belabor it, and maybe we'll edit this also out of the narrative. But A, I know that Mac Laetsch was very upset that the director of the Lawrence Hall of Science was not an Academic Senate person and he felt—

45-00:27:56

King:

Oh, ex officio, you mean.

45-00:27:57

Rubens:

Yes. And I really can't speak for him. What I believe he's concerned with is the diminution of the role of the director of these museums or programs, because they're not led by faculty. Our director of ROHO believes deeply that ROHO must be run by a faculty member.

45-00:28:40

King:

Well, let's get cause and effect sorted here. You could say that you should only appoint a faculty member to such positions, so the person is already a senate member and the fact that the position is restricted or focused on senate members means that the new director will be a senate member. Or does the person get senate membership ex officio even though they're not a professor at all? The latter is the more interesting question. I suspect that the view with regard to the Bancroft Library and such units has been, and ROHO, has been, that you should limit the pool to people who are already professors and thereby senate members. But the second question is an interesting one because certainly there can be people brought in as director of one of these things, like the Hearst Museum or the Lawrence Hall would be another good example, or for that matter the Botanical Garden, or even the Paleontology Museum, something like that, who are not faculty but are very accomplished in intellectual ways of some other sort. Should they then de facto get senate membership? That, of course, would be a matter for the senate to determine, not for the whole campus to determine. And I suspect that the answer is pretty clearly no on that, the way the bylaws of the senate are written. They specify what you have to be in order to be a member of the senate. But I personally believe that you could well go for somebody to direct one of these units who would be every bit of the intellectual caliber of the Berkeley faculty and there is an argument that that sort of person, maybe by

meeting some sort of review or test by the budget committee or some other body, should become a member of the senate.

45-00:31:09

Rubens:

Then it sounds like you're saying it's not a diminution of the position of director if they're not a faculty member.

45-00:31:23

King:

I don't think so. Well, I believe that the director has to be somebody whose intellectual world is such that they can deal even up with the faculty.

45-00:31:40

Rubens:

I was thinking implied in what you've said is that one's looking for the skills to lead and experience with museums and programs that face outside the university rather than inside the university and that clearly was taken into consideration for both these hires.

45-00:31:57

King:

Yes. Also, as another half of that earlier answer, I don't really believe that you increase the standing of a person with the faculty by awarding them senate membership. I think it's just what transpires between people that creates academic respect and not names and titles or senate membership or no senate membership. That's where I would come down on it.

45-00:32:26

Rubens:

Okay. So I think we're going to make a transition back to looking at your work at the Center for the Study of Higher Education. But I think we do need to establish the point that during the twenty-seven months you were there—it was into your third year- you were also the director of the Center for Studies in Higher Education—

45-00:32:58

King:

Yes. And that was rather intense. Just to segue away to some of these other things also. I have one way or another been doing something for the chancellor or for the vice chancellor most of the time while I've been a center director. It wasn't just the Hearst Museum. There have been other things, too.

45-00:33:40

Redman:

So throughout all of the hours of this interview, we've seen that throughout your entire career you've been interested in chemical engineering and education. But here at the Center for Studies for Higher Education you have a particular platform with which you can study these problems. So I'd first like to talk to you about your ongoing interest in the relationship between engineering and education and the actual field of engineering. And I know that you've made the

argument that today's undergraduate engineering education isn't equipping students with the necessary tools for the field.

45-00:34:14

King:

Yes. The next one of these articles I'm going to entitle "The Engineer as Nerd." [laughter]

45-00:34:22

Redman:

I'm not sure if it will actually make them less nerdy but you've recommended bringing in more liberal arts content into the program. Can you explain—

45-00:34:33

King:

I have. And I've had this bug for some time. I have written occasional small pieces over the years before I got here to the Center and I did find that I had written one in I think 1985 entitled "Engineers Should Build Bridges" and that was published in a chemical engineering magazine. But, of course, the bridges we were building were not the Bay Bridge but bridges to other disciplines.

Another approach that sort of epitomizes what drives me here is I remember very well my fiftieth reunion of my Yale class. I was class of '56, so that reunion was in 2006. And what Yale does is to prepare a big book in which everybody writes an essay about what they've done in life and their thoughts back on Yale. And I read the essay of a person I had known well while at Yale. He was an engineer. He happened to be an industrial engineer. His essay started or ended by saying, "I really missed my Yale education because I majored in engineering." Well, this is the same point of view.

A thing I found out when I was a provost for professional schools and colleges was that just about every other profession accredits at the graduate level so that your education in law or business or whatever can be based upon a traditional liberal undergraduate education. And yet engineering has not done this. Decisions were made back around 1900 and thereabout that put the professional degree at the bachelor's level rather than at a post-graduate level. And there have been a series of reports over the years that have urged that engineering develop a broader base for education. Usually these have recommended what is to me the impossible, which is to shoehorn still more into the undergraduate education. It's already the most crowded curriculum on campus. Very sequenced. You have to take this before this, before that, before that. And there just isn't room to do it the way the bachelor's programs are now put together and taught. So I have had a concern about this. I am not the only one with this concern. There are a number of other people, some of them quite prominent, who share this concern.

And so as I got to the Center I realized, yes, I did have a platform whereby I could try to work this issue. In addition to doing things that were actual research and reflective writing, I thought I could afford one project that was really advocacy and so I went to work on the engineering question. I decided to start by writing a piece that I submitted to the editor of the National Academies magazine, which is called *Issues in Science and Technology*. Wrote that, attracted the attention of the editor, who seemed to sympathize with it. He did some editing, as editors do, and one thing he did was change the title so that it now read, "Let Engineers go to College," which is another way of stating the issue.

So I then decided that I would try to find a way to move this along. I had found a lot of other people and a significant number of articles who do believe this way. But together we amount to no more than possibly three or five percent of the engineering profession right now. It's interesting. The people who recognize this need are the people who have had the very wide experiences and they see that many other things impinge on engineering issues. And so where I get the most sympathy for this is within the National Academy of Engineering, which tends to be people who have had broad experiences and a lot of accomplishment.

So among the allies I found rather early on in this were Jim Duderstadt, who is a former president of the University of Michigan and now runs something called the Millennium Project there. I found Bill Wulf, who for two terms had been president of the National Academy of Engineering. He's a computer science faculty member from University of Virginia. He pushed this strongly within NAE. I found here at Berkeley quite readily Karl Pister. That didn't take any locating. I knew his views from early on. And I found John Prausnitz, who we've talked about. A fellow chemical engineer and who is also a member of two National Academies, both engineering and science. And I rather rapidly signed up Kyle Vanderlick, a much younger person, a woman, who is the dean of engineering at Yale now. But, of course, Yale would feel that way. And Norman Fortenberry, who is an interesting fellow who had been with the National Science Foundation, directed the Center for Scholarship on Engineering, Education that I think we've discussed, one of my activities, maybe we haven't. But that's NAE's one operating arm to try to promote scholarship on engineering education. I've chaired the advisory board for that for a number of years. I also participated in the committee this summer that recommended its discontinuance so that NAE could do bigger and broader things. Fortenberry, though, to go back to him, he's now the executive director of the American Society for Engineering Education. Took that job within the past year. So that's somebody in a good position to help out on this.

I worked with this group and started writing short and then longer and longer proposals that would have to do with getting the group together, analyzing the issues, publishing an analysis and a path as to how the country could be moved to a change. Before going further I have to say what the change is and the other half of what I'm pushing here. I think you do need the broader undergraduate education and therefore there is no alternative to putting the professional degree at the graduate level rather than the bachelor's level and be like every other profession. So that's really what the push is, is to put the professional degree, the accredited degree, the meal ticket degree, at the graduate level. It could be master's. It doesn't much matter what the name of the degree is. And then use the space liberated for changes in the undergraduate program and what you do as an undergraduate.

So we try to get support from any of several foundations, to hold a meeting, get a small staff and try to work the issue. None of those succeeded. It was outside the boundaries or purview of most of the foundations we went into. They said, "Well, we don't get into that kind of thing." So then I tried the National Science Foundation and wrote a proposal, again with this committee of six, the people I've just named who I interested in it along with me, and submitted that in a competition. That was sent out to all sorts of people within engineering for review and we still have the ninety-five or eighty-five percent of the field that doesn't like the idea of the change and so that got poorly reviewed and therefore didn't get funded. So the most recent thing I've done is to take all the beautiful words that were in that proposal and turn them into an article and that I wrote and we put on the ROPS website of the Center here—Research and Occasional Papers Series—and that's been picked up quite a bit. I did send it off to the editor of the Journal of Engineering Education and that write-up is now going to be the guest editorial in the January 2012 issue. And about a week ago I got a communication from the dean of engineering at Georgia Tech. They are having a faculty retreat for two days. Would I please come to Atlanta and be the dinner speaker? So things are happening. And that's really a pleasure and a joy because this is what I feel rather intensely about.

The strongest feeling is that the professional degree needs to go to the graduate level and that the undergraduate degree needs to become broader. For people who believe that, there is still discussion and controversy with regard to what should the undergraduate degree then look like, and there are some who promote a pre-engineering degree. I'm just reading a paper written by a retired professor from MIT who is joint between mechanical engineering and humanities in his appointment and he urges a specially constructed undergraduate degree that rings much wider disciplinary thinking than engineering

together in sort of a, I believe, I have to read this further, but it seems to be an issue or problem focused context.

I would welcome undergraduate students having all kinds of different backgrounds and then going into engineering. I think that's healthy. And so I more like the premedical model, whereby you can major in whatever, except you should have taken these eight courses if it's chemical engineering and those eight courses if it's mechanical engineering and so forth as part of your undergraduate education. And that is what pre-med requirements are like. You can major in anything. You should have taken organic chemistry, calculus, physics, biology.

45-00:45:42

Redman:

I have a number of questions but first I'd like to back up and ask if you have a sense of why, around the turn of the last century, the decision was made to keep engineering at the undergraduate level?

45-00:45:58

King:

Engineering was originally a mechanical arts discipline. In fact, do you know what was the original engineering college in the United States? The answer is the United States Military Academy at West Point. And the decision was made that a general engineering degree should be the West Point degree. Sylvanus Thayer, the founder of West Point, made that decision. So engineering was very mechanical without much science at all in the early days. And it did stress having liberal components of the degree and you can go back there, as this MIT professor I just mentioned has done in his paper, and you can see that degree requirements were quite broad but there wasn't that much engineering because engineering wasn't that much. Then the amount of what should go into engineering education increased and increased and the World War II experience was very important because there you had a grand exposition in the Manhattan Project and the Radar Lab and such that science could make great advances for mankind in a very practical way.

It has always been somewhat striking to engineers—they even hate to recognize the fact -- that the credit for the Manhattan Project is given to physicists, not engineers. And you go back and ask where are the engineers. And yes, there were some places where engineers were very important, such as in the separations end but in the bomb itself, that was indeed physicists working in an applied fashion. So engineering recognized that after World War II and here came then the engineering science wave and so a lot of science got into undergraduate engineering, including engineering courses, not just the chemistry and physics courses, but also the engineering courses themselves. And that really packed the curriculum.

So it's just that they have never moved beyond the bachelor's degree as the accredited degree. Why isn't there movement? And I think the problems are these. Number one, faculty either don't recognize the need or are bothered by the idea of all the work involved and change being added to their present workload. That's faculty. Students and families would have to pay for another year or two for education. Well, money. And recruiters. And the industrial situation is particularly interesting because one of the people who shares my views and has written on the need for this change is Norman Augustine, who for years was the CEO of Lockheed and Martin and chaired the National Science Board and chaired the Boy Scouts of America even. Very busy man. But he sees the need. Yes, he's had broad experiences. But how about Lockheed Martin recruiters coming to campus to recruit students? They're perfectly glad to recruit at the bachelor's level to fill entry level jobs. The recruiters tend not to be thinking about an entire career of a person. They are thinking about today's need for filling specific positions at a low engineering level within the company.

So I think those three things, the difficulty of the faculty adopting the idea, the perception of expense and what recruiters seek, or put another way, the idea of a Norman Augustine not having propagated down sufficiently within the person's own company, that's what's held it back.

45-00:50:36

Redman:

Has there been a concern about the previous generation of engineers, should this change happen, that all of a sudden you're going to have engineers that don't have the right engineering degree?

45-00:50:49

King:

Well, that's an interesting thought. There are lots of things that are challenges within a transition and that probably would be one. However, my experiences would say that's not going to be much of a factor because people are judged on what they've done once they're five years out, not what their education was.

45-00:51:11

Redman:

So there would really only be a problem in the very recent graduates?

45-00:51:18

King:

Well, in that most of these people who still have just the bachelor are five and more years out. They're getting their respect and work assignments and such things very much on the basis of what they have already done with a corporation rather than what their education level is.



45-00:51:43

Redman:

Maybe this is because we've spent so much time talking with you. But this seems so clear. I'll go on record. It seems like a good idea.

45-00:51:55

King:

May I sign you up?

45-00:51:57

Redman:

Yeah. I'm curious.

45-00:52:01

King:

It's a tough battle.

45-00:52:02

Redman:

I recognize the practical issues. I recognize the concerns that faculty might have. Some of them might be out of jobs, if that was the case.

45-00:52:11

King:

No, I don't think so. I don't think they'd be out of jobs. It's just that you're going to have to restructure the curriculum. The undergraduate curriculum is much more things rather removed from engineering and less engineering itself. So I suppose you might worry that the workload of the department is going to go down and you will have a smaller faculty as a result, except for the fact that you're going to be giving this degree to people at the graduate level and that will be workload that counts for you. So I actually think for funding within universities, it's not that much of an issue. An engineering school can justify its faculty numbers and its size and its budget perfectly well, maybe even better in this new degree structure.

45-00:53:04

Rubens:

Why could biology do it? Was that a critical historical moment?

45-00:53:08

King:

Medicine, you mean?

45-00:53:10

Rubens:

Well, no. I meant biology. The whole biosciences.

45-00:53:12

King:

Oh, the reorganization. Oh, that was an extremely difficult adventure. And I came in on the end of that, as I think we discussed in one of those interviews back there. But that really required top down work and was not something happily received by most of the biology faculty. So that change, of course, is within a single university. That's different from trying to change a nation, although the way to change a nation may be to get a Georgia Tech interested in making the change and showing that it works. That's a good reason for my going to Atlanta on the 7th of December. [laughter]

45-00:54:00

Redman:

I'm so struck by the fact that—these are soft numbers, I'm sure—but 90 percent of engineers don't think this is a good idea. Why?

45-00:54:13

King:

Most of them have not been performing in a broad world. You can, in many engineering jobs, just sit there and do your solving of why this pump broke or how to design the next catalytic cracker or whatever. Similarly, for faculty, they're not out there in that world. They are pursuing a line of research which these days is a narrow line rather than a very broad line given how deep knowledge is now. So they don't see the need. It's those who have had the experiences that are broad who do see the need. Nonetheless, I think there are ways of getting this done and one is to have some Georgia Tech's. Not a Berkeley. That'd be very hard. Get some universities do it. Another is to have some of the things that do exist succeed and be recognized. Smith College, where Carol Christ is president, did institute engineering about fifteen years ago, ten to fifteen years ago, and has done it as a liberal arts degree. You, as a graduate, are a graduate just in general engineering. You get accredited as an engineer but not as a chemical, mechanical or electrical engineer. And their goal is to prepare you for graduate work wherever you may want to go and it works just fine. And bringing a West Point general engineering graduate into graduate school works just fine when it happens.

45-00:56:01

Rubens:

That's a four year—

45-00:56:02

King:

It's a four year degree. So that's one. Yale and Harvard are two others. Both have been through agonies in engineering as I think we discussed and they both have undergraduate engineering degrees within the college, which means subject to all the distribution requirements of Yale College or Harvard College. And they give accredited degrees. There's also, at Yale, a bachelor of arts in engineering which is a non-accredited degree. This is something different, not unlike the kind of undergraduate degree that I would propose and it does equip you not only to go on in engineering but also to go to business school or medical school or law school or whatever profession you might like.

## Audio File 46

46-00:00:00

Redman:

I want to see how much of a radical you are on this. In one of your articles you mention that engineers should, among other things, but be trained in economics, business and law. And my question is, is this something that you think that all undergraduates should study this in

order to be prepared for the world or is there something about engineering in particular that those subjects are so important?

46-00:00:40

King:

Well, the thing about engineering in particular is that it is the professional degree that is—the professional degree at the bachelor's level, whereas art and medicine—now art, law and medicine and others have been changed for a long time. So I think the need is general and I do believe in a liberal education, yes, and so that's another way of looking at it. I believe in an undergraduate education, and to a significant extent, a multidisciplinary education because I think the issues of the world are over time becoming more and more multidisciplinary. It takes the strong talents of more than one discipline to address them and therefore graduates have got to understand more what comes from different disciplines. People from different disciplines have to be able to work together, and all of that calls for an exposure to different types of things in the undergraduate curriculum, particularly since different disciplines think in different ways and structure their approaches in different ways. Now, that's not so true going from chemical engineering to mechanical engineering but it is true going from economics to political science to sociology. So the ways of thinking of these different disciplines, there's value to having some appreciation of what it is for most people.

46-00:02:31

Redman:

You also mentioned that you think that today's engineering education is too quantitative.

46-00:02:38

King:

Yes.

46-00:02:39

Redman:

If I'm understanding your point correctly, this is different than asking undergraduates to study Chaucer. You're saying that engineering education should have more of a practical component to it, as well? Is that correct?

46-00:02:54

King:

No, it should have more of a qualitative component to it. And here's the point I'm getting at. First of all, you need these qualitative things in today's world to have a full appreciation of what you can do and need to do as an engineer. That's one of them. But it also has to do with whom we get into the profession. And the engineering profession has made some progress but not much. It is still a mostly male and mostly white and now Asian profession. And to my mind, it's because it's drawing people who are in love with the quantitative, who love math, who love the logic of science and do what I did. I mentioned this before, I think, too. I went to my high school chemistry teacher and I

said, “I like chemistry, I like math. What should I major in?” He said, “Chemical engineering.” And that had nothing to do with what chemical engineers do. It had to do with what is the intellectual component of chemical engineering education.

So I think engineering needs to draw people who are there because they are drawn by what engineers do and can do rather than “I like math.” And there is a large body of research on this subject and that body of research tends to conclude that particularly for women and ethnic minorities, that latter one, what engineers do, is much more of an attraction than the I love math, I want to stay with math sort of thing. So it does also have to do with who we’re going to draw into the profession.

And I think finally, another virtue of this change, if it can be accomplished, is to enable entry into the profession at later and later points. In the world we’ve been in, you pretty much have to decide sometime in junior high school that you want to go a science techy route and so you do take algebra, you do take plane geometry, you do take trig, et cetera, and you do take high school sciences. Otherwise you’ve got a much rougher path going into engineering. If we can structure this so that that sequence isn’t so much the basis, but you can switch into engineering in your junior year or even at graduate school if you have a science or math degree, then that’s going to be more compelling to bring people in and I think it will make the decision based more on what engineers do and can do than on I love math.

I want to give you one other part of the engineering education story and then I’d be willing to deal with questions. But we could also move off of it. The other thing is the rest of the world is changing and that’s the substance of this most recent article I wrote. And the rest of the world is changing because the rest of the world either is trying to upgrade itself or is doing a structural examination of its entire higher education. Forty-six countries are now subscribed to the Bologna process in Europe. All but Belarus. Why it’s out I don’t know.

46-00:07:02

Rubens:

And what is the Bologna process?

46-00:07:04

King:

The Bologna process is an endeavor to devise a common degree structure for those countries. See, the problem is they all started out with different degrees that weren’t the same from one country to another and you might do one degree for four years here and for seven years there as was the case for engineering in France and Germany. And therefore you couldn’t traffic back and forth between countries, going from one degree to another, as you went through successive

degrees. So at the government level it was actually ministers that got together and started this. At the government level they decided, “We have to get a common degree structure.” And for nearly all, that means they have to change their degree structure. And since they’re changing their degree structure, they have to examine what fits where. The Bologna process has come up with first cycle, second cycle and third cycle degrees which roughly correspond to the bachelors, masters and doctors in the US. And so now where is engineering coming down? And more often in the Bologna decisions, it is coming out as a second cycle degree than a first cycle degree.

And then other countries are watching them and other countries are doing some things of their own. One that I find particularly interesting is the University of Melbourne in Australia which has something called the Melbourne model which offers, I think, only five different undergraduate degrees. You can get a degree in science, you can get a degree in humanities, you can get a degree in business because they want to import lots of students from other Asian countries paying full fee to study business. That’s a different thing. But only these very few and very broad undergraduate majors—engineering at Melbourne is now a graduate program to get a degree.

And there are other stories like this. Japan has all of its so-called national universities which more or less coincide with their best universities. They all have put engineering at the master’s level as a professional degree and the corporate recruiters have bought in. So now the problem is the rest of the world changes, the US doesn’t, and that the US recognizes the entry level engineering jobs are going to India, China and other places of low wages like that and that the US therefore has to have a distinctively more capable engineer and yet we’re going to be the ones producing with the bachelor’s degree while the rest of the world produces them with a master’s degree. This does not fit.

46-00:10:02

Redman:

And I’m interested. This might be too new to have this sort of data. But in terms of engineering skill, the quality of engineers, is it clear that these engineers coming out of graduate programs are better?

46-00:10:22

King:

They are if they have to deal with a situation where they have to interact with other disciplines intensively and/or they have a problem area that sits very much in the public interest. So engineers dealing with water supply problems, waste disposal, climate change, et cetera. These are places where you have to have a wide appreciation of many things, many of which are very social or political in nature rather than just engineering. And that’s what engineers tend not to have and that’s

why there is the classic thought of the engineer as nerds, to go back to the beginning.

46-00:11:13

Redman:

And I don't know this, but I'm assuming that with the daily advances in things like computer modeling you will have more and more engineers who do need to interact, that aren't just sitting at their desk and being computers.

46-00:11:28

King:

That's correct, yes. Particularly as the rather rote entry level jobs go to China and India and other such countries. What is left for the engineers who will be in the United States is these more complex job functions, most definitely.

46-00:11:51

Redman:

If the United States changes.

46-00:11:52

King:

Yes. If it can produce engineers who can do this well.

46-00:11:59

Redman:

Do you think it's going to happen?

46-00:12:01

King:

Yes, I think it will happen. I think the only question is the time period. I think the one that's going to force it, that is going to happen irresistibly is the change driven by the Bologna process, which means the rest of the world, as is already happening, is going to go to graduate professional degrees in engineering and the US will just have to do it to keep par with the rest of the world. That's the path of least resistance. The question is can we do it sooner?

46-00:12:29

Redman:

I'm actually also curious. You had talked about the various places of entry into engineering and right now there isn't much choice. You have to pretty much know in high school that you want to be an engineer.

46-00:12:46

King:

Yes.

46-00:12:47

Redman:

What is the status of graduate level engineering education in the United States now?.

46-00:13:01

King:

The master's degree is lightly used. There are exceptions to this which are schools with very large master's program. By and large, graduate education is the doctorate and then the master's at the leading

universities tends to be a lesser degree. As I say, there are great exceptions to this. Some universities have large and very successful master's programs. But then in terms of the educational expertise sought by corporate recruiters, frontline recruiters, the masters and the bachelors are sort of interchangeable in their minds. And so there is not a clear incentive of why get a master's, even though you get about twice as much actual engineering education. And then the doctorate, particularly in chemical engineering, and I believe it's as true in a number of the other engineering programs. The doctorate provides people for industry as well as education and for government. The doctorate's very valuable for a government job. So if I look at where my forty-three doctoral students are, there are only about five of them in universities and the others are for the most part industry, some of them government, some of them private consultants.

46-00:14:42

Redman:

Well, I'm curious about the master's programs in particular. Are those open and available to, let's say, someone like me. I exited undergraduate with a physics degree. Are there engineering master's programs that then I could become an engineer in two years instead of four?

46-00:15:02

King:

Well, I think they're certainly needed and there are not many. In chemical engineering we would take some entry graduate students who are chemists and that would work pretty well.

46-00:15:18

Redman:

But that was in the PhD program?

46-00:15:21

King:

Yes, yeah. That was PhD. Well, no, we had master's program, too. That has changed, by the way, in the chemical engineering department over the time I've been here. The master's program, we probably had twenty students a year in the master's program when I came here in the sixties and that persisted into the seventies and now there are virtually no master's students. It's a change over years.

46-00:15:48

Redman:

So not only are there no—

46-00:15:53

King:

But I believe that what you suggest is exactly what should be. How readily is it done? Well, I think with your physics degree you could probably apply to five graduate schools and get admitted to one, to the master's program in engineering.

- 46-00:16:13  
Redman: Okay. But it is highly unlikely if you did not have either a physics degree or a chemistry degree?
- 46-00:16:21  
King: Yes. You can see I believe in this topic. [laughter]
- 46-00:16:36  
Rubens: So you talked about that you think this change will come about.
- 46-00:16:40  
King: Over time.
- 46-00:16:41  
Rubens: But in terms of just targeting areas in which to start peppering it, you've mentioned mainly the national academies, that that's a source of—
- 46-00:16:54  
King: Where I find resonance with this?
- 46-00:16:56  
Rubens: Yes. Well, there's another place where I find resonance. Outside of engineering. I find huge resonance there.
- 46-00:17:09  
Rubens: What would be an example of how you measure that? Are you saying amongst other faculty or—
- 46-00:17:15  
King: Well, if I'm talking to a fellow provost, back when I was a provost, and that provost is a historian or—whatever else, not an engineer, of course.
- 46-00:17:28  
Rubens: University administrators.
- 46-00:17:30  
King: Well, also educators. John Douglass. It doesn't take much to convince him that I'm right on this.
- 46-00:17:40  
Rubens: How about someplace like the AAU [American Association of Universities] that would take a position on this?
- 46-00:17:49  
King: Well, so the question that poses is, is engineering going to change itself or are the universities going to change engineering? Take the Melbourne model that I had mentioned just a few moments ago. That's a matter of the entire university changing and thereby changing engineering. That's the kind of thing that can come from the top of a



university, although in the world of Academic Senates it's not an easy thing to do. But for engineers to change themselves, which is pretty much what we've been looking at because engineering accreditation belongs to engineering, it does not belong to the university world and the professional societies are engineering societies and the faculty determine the curriculum. The faculty of a department. We've been trying to work for the most part within engineering. It's hard to think of a road whereby big pressures from outside engineering are going to result in engineering saying, "Oh, my gosh, they're making it so that we have to change." I don't think that's as likely.

46-00:19:04

Rubens:

When you were pointing to the studies that say once somebody, particularly women and minorities what they could do as an engineer, what jobs might be available, that then they are more open to the math and science. What about the targeting at the grade school levels? Emily's particularly interested in STEM programs. I don't know if that targets grade school. But what's got to change at that level, too, the kind of math and sciences.

46-00:19:37

King:

If you go to the National Academy website, you will find that there has been a National Academy of Engineering major committee during the past three or four years to look at the introduction of engineering into the school curriculum. So yeah, I think that's important. I also believe, incidentally—when I talked about liberal education, that's a liberal education that includes science and engineering, not one that doesn't. And so I do believe in the assimilation of science and engineering concepts by all students, no matter what they're majoring in. Not a lot of science and engineering concepts but they need to know what the beast is and what it can do.

46-00:20:28

Rubens:

Emily and I were just talking about it. She has taught in the history of science here at Berkeley and we've noted that in traditional history programs there's little attention to science and industry. It's really important. Critical part of the whole fabric of American history.

46-00:20:47

King:

Oh, definitely.

46-00:20:51

Redman:

Is this particularly a problem? Because as far as I'm aware, at smaller liberal arts schools, there is no engineering degree.

46-00:21:05

King:

That's correct. You will not find engineering at Williams or Amherst I don't believe.

46-00:21:11

Redman:

Right. Okay. So then because of sort of the structure of how these large research universities structure their undergraduate degrees—

46-00:21:21

King:

Yes. It is largely that, although I must say the Ivy League has been coming into the picture significantly in recent years. I mentioned Harvard and Yale. Engineering had been gone at Harvard for a long time. It's now back. Brown has just done some things to reinforce engineering. Penn always had it and very good and very strong. Cornell always had it, very good and very strong. Dartmouth has had an interesting breed. It really fits in there with Harvard and Yale. It's a broad education but it is engineering. Have I done my Ivy League schools? Oh, Columbia. Columbia has always had engineering and done pretty well by it.

46-00:22:11

Redman:

I'm curious, too. Are these problems in undergraduate engineering education, have they been around—

46-00:22:20

King:

Yes.

46-00:22:22

Redman:

Was there a problem when you were a student? I'm sure you didn't see it yet—

46-00:22:26

King:

There was most definitely a problem. My classmate said he'd missed his Yale education. I had one true elective as an undergraduate at Yale. So I think it has been a problem for a long time and it has been a recognized problem for a long time. There are these things like the Wickenden report, the Mann report, the Grinter report that have come along in intervals of five or ten years over the years. And they usually do start up by pointing out the need in some way for broadening of engineering education. Not necessarily the transition to the graduate professional degree but breadth, breadth, breadth. And it doesn't happen. And I think it doesn't happen because here is a package of finite size, a four year bachelor's degree that in the University of California should not exceed 120 units. And what can you put in it? You can't put much beyond the engineering and the things that are on the road to engineering, like math, physics and chemistry.

46-00:23:39

Redman:

This is certainly not a good reason to restructure engineering in such a large way but I am thinking in terms of my own experience: the physics major was pretty programmatic, as well, and you had to take certain classes at certain times. And one thing that I was not able to do,

even though I went to a liberal arts school, is have the possibility of ever studying abroad because of that programmatic nature.

46-00:24:06

King: Yes, you are correct.

46-00:24:07

Redman: Is that something that you personally are concerned with?

46-00:24:09

King: Well, Bologna will help. It will help because it will make the bachelor's degrees around the world look more like one another, except for the fact that all the rest of the world is going to the second cycle engineering degree and we're at the first cycle engineering degree. But that was a concern of mine while at the office of the president. It was also a concern of John Marcum, who headed the education abroad program during my time at the office of the president. Is that for engineering majors? It's very hard for them to go overseas because the pattern of the undergraduate curriculum is different. That remains a problem today.

46-00:25:07

Redman: All right. So I would like to switch gears a bit and talk about the small problem of the state of the modern research university.

46-00:25:16

King: Ah, the small one.

46-00:25:17

Redman: Yes. And in particular I want to talk about how the sciences fit into that. So more and more we're seeing the research at these large research universities be in the sciences. And I'm curious. There are lots of reasons for that but I'm curious sort of what your thoughts are on the fact that the research university kind of means the lab.

46-00:25:41

King: Now, let me make sure I understand the question. A drift of the research universities to have science be a greater percentage of what goes on?

46-00:25:50

Redman: Right, right.

46-00:25:52

King: Okay. I think it is happening. Probably the largest driver to that is the growth of government support for research in science and secondarily engineering.

46-00:26:10

Redman: And does that mostly come from NSF or are there other large players?

46-00:26:14

King:

Oh, it comes from many places. The Department of Defense is quite large. National Institutes of Health is our biggest one. And NSF, Environmental Protection Agency, Department of Energy. We've always had a very diffuse multi-departmental support of the scientific research establishment, which I think is good. That's a diversified portfolio, if you will. So I think the trend toward more science and engineering came with the growth of government support of research in these areas and the fact that university budgeting could be helped and hurt by a further drift into those areas, helped by the fact that you could recover overhead money for much of the support of that research and the research could support itself and pay people. Hurt in that as a university drifts more and more toward science, science is big and requires facilities and instrumentation, and as we are today, you're into million dollar start-ups for a science faculty member and nothing like that for a non-science faculty member. So I think there has been a drift. I think there's been a large growth of knowledge. The explosion in biology had a significant amount to do with this, the intellectual explosion in biology. I think it's a serious issue. I do believe in the balanced university and I think there's such a thing as too far. I don't really know what more to say about it than that.

46-00:28:26

Rubens:

What about the trend? Maybe I don't know it nationally, but certainly it's true for the UC system, of administrators being scientists? Chancellors?

46-00:28:40

King:

Yes. That's somewhat national. Yes, at times we've counted chancellors and what they were. A lot of them were scientists and engineers. I used to think that the proportion of engineers among top university administrators was far less than the proportion of engineers among people or faculty. I'm not sure that is the case anymore, although if I look at the University of California I am going to find one engineer. I am going to find a lot of scientists.

The one engineer that I think of is Henry Yang. Now, there may be another but that's who I'm thinking of. I do think there has been a tendency to value some things in university administration that come more with scientists and engineers and lawyers than from other people. Certainly the amount of legal things impinging on the university probably encouraged looking more at people whose training was in law. I think the fact that there are a lot of government regulations, you have to be careful about environmental health and safety, that capital projects are a very large part of the overall budgetary picture. These are some things that lead to engineers. But I think they lead in an indirect way. That is a search committee going into a search for a university president or provost or dean. Let's leave out dean. Let's stay

at the higher level. University president or provost. They don't say, "I want an engineer or I want a historian." They don't say that at all. They look for all comers without regard to field and then they evaluate how the person thinks, what they are, what they can do. And it may be that there's some leg up to engineers and scientists in that showing of what you can think and do with regard to what are the current issues of universities.

46-00:31:24

Redman:

Well, and maybe some of those faculty appointments have built in a lot more administration, in some sense administering of the lab. So I would think that that experience wouldn't count for nothing.

46-00:31:36

King:

I think you're right.

46-00:31:44

Redman:

I'm curious, speaking of administration and wanting a broad education, if you will recommend when you go off to your next position somewhere, if you will recommend having someone who's not in the sciences direct the CSHE.

46-00:32:05

King:

Oh. [laughter] I don't think I would recommend one way or another on that. With regard to what the natural field is for directors of this center, they are twofold. They are people who are lifelong scholars of higher education. That is what they've published in all throughout their careers. My predecessor Martin Trow was a pristine example of that and that's been fine. The other possibility is somebody who has the sort of background I have, that is they are, if you will, more of a practitioner than a theoretician or whatever on the issues. I think both can be valuable and probably going back and forth between such is a good thing to do. I do think that being just about the only scientist or engineer that I know of directing one of these things has been an asset and just an asset from the standpoint that the best things to do are in the realms that are little traveled. And so there has not been a lot of attention at these centers to the issues that impinge upon science in the big research universities or science policy or that sort of thing and yet that's very fertile running room. That's fine. We should have something of everything in the centers around the state, country and world.

46-00:34:05

Redman:

So the research university as a theme aims to give back to the community and the state and the nation and the world. So by emphasizing science, in a lot of ways more so than the arts and humanities, the university emphasizes scientific and technological fixes to problems. Is this how it should be?

46-00:34:34

King:

Let me make sure I get that question right. That the university emphasizes scientific and engineering solutions to problems? Was that it?

46-00:34:42

Redman:

In the fact that the research university, one of the goals is to be able to take this knowledge produced in the university and give it back to the state and the world. If the majority of this knowledge production, or if a large proportion, maybe not the majority, is in the sciences, is in areas of technology, are research universities providing the right stuff?

46-00:35:12

King:

Oh, I see what you're getting at. Well, that's why I believe that the balance is needed and that there is such a thing as too far. I don't think Berkeley is too far at the moment, by the way. Stanford might be. There's a very different proportion there. But I think Berkeley has been able to keep the balance pretty well.

46-00:35:55

Redman:

And on a sort of similar line. Twenty-first century life requires a lot of technologically savvy people. Is the research university addressing this appropriately, doing a good job of that?

46-00:36:12

King:

Yes. I think much of the research university does have that issue in mind. I can't say that it's the dominant criterion in selecting what disciplines to have or what to grow, what not to grow. But I think it is very much in mind. There is also a considerable issue and disagreement on the subject of whether the US educates enough scientists and engineers for what the job market is today. And I think that is something that has to be looked at and kept in mind, is where are the jobs and what sort of qualifications are needed for those jobs and should the sorts of people we turn out correspond reasonably well to that spectrum of jobs. That's an important issue.

46-00:37:10

Redman:

I'm also interested in how information technology itself has impacted how science is done at these large research universities. Things are more international, I'm assuming? Laboratory work doesn't have to happen all in one lab?

46-00:37:27

King:

That is right. I think there have been large changes there. The ones that I have seen—oh, there are many. It's hard to know where to start and where to end. Among the changes, much more collaboration within the sciences, both because it's easier to work with somebody far away or even in another country but also because you get into areas where very sophisticated instrumentation of different sorts is needed to do the

research. This is somewhat characteristic of modern molecular biology and so you go and find who is the expert with the instrument and bring them into the team and they become a co-author of the paper. So there's been a lot of growth of that, of collaboration because it's easier to do it now and because sophisticated instruments of different sorts are much more needed and useful than they were in the older days. So that's a change. The rise of the computer most certainly so in several ways. One is that you can do simulations that were not possible in the past. And so there's a lot of opportunity for that. But the computer has also brought possibilities for new forms of communication among people. Even if you're not partnering with somebody in research, you can spread the word about your research however you want in ways that are dependent on using of the computer and not just simply wait for the next technical meeting to go and decide how often you should go to Europe in order to get your work sufficiently known there. Those things are less of an issue and the opportunity for electronic dissemination of your results, your papers—

46-00:39:41

Redman:

E-prints and preprints.

46-00:39:43

King:

Everything. Databases have become much more of a factor, so that's a change. The degree of use of sophisticated instrumentation and research is a change. There is much more use of it now than there was when I started out. There are people who build their research careers around mastering a certain type of measurement. That was less the case in the earlier days. Incidentally, my whole research career, that was something I did not do much, was to try to find sophisticated instrumentation as the next new thing to bear on a field. I instead tried to come up with the right experiment and simple ways of doing that experiment. So what I'm describing is how the field has changed, not how I have changed were I still doing research. So, yeah, I think it's been enormous and the way people receive information—this was a project we actually did at the center and I think we discussed—when I got here, one of the things I started off on was so called scholarly communication and Diane Harley still does this. So this gave us an opportunity to look at how different fields do research. The astronomers have a morning email bulletin that comes in with everything interesting that's happened, and the field is small enough so you can do that. The molecular biologists don't have that at all because there's more secrecy within the area. That is, you want to be further along in your research before you tell its results to the world. The economists work in an arena where you publish successive versions of whatever it is, working papers and there may be thirteen generations of your working paper over time. They're all very different. And these

are all ways in which information technology has attained importance and utility in how these fields do research. It's quite fascinating.

46-00:42:04

Redman:

With scientific fields across the board evolving, how does the twenty-first century research university have to evolve to continue to support the ideals of science? Does it need to evolve?

46-00:42:23

King:

The composition of a research university. Oh. This one is worth four hours. I'll tell you how I think it most needs to evolve. It needs most to evolve in the directions of enabling and encouraging the disciplines to work together, the different disciplines. So I think anything that results in effective multidisciplinary approaches on research is a very good new direction for universities. I think we are at the point where the advance of knowledge impinges at least as much on bringing concepts of disciplines together in doing something than in going deeper, deeper, deeper within a single discipline. Yes, we're still doing a lot of the latter and there will continue to be a lot of the latter, going deeper, but I think the greater advances now lie at the combinations.

46-00:43:42

Redman:

Do you have recommendations for how that could practically be done?

46-00:43:44

King:

Well, this is one of the projects I actually got put on here after I came back to the center when George Breslauer first became vice chancellor. He asked me to look at the health, if you will, of the multidisciplinary initiatives that had formerly been started by the campus in 2004. No, 2003 or '04, based upon a competition that was held where a portion of a group of new faculty slots for the campus got put into these multidisciplinary initiatives. So I actually have spent some time looking at this issue and I find it quite fascinating. I think the ways of using the classical old business research lab model of cross-matrix management is the answer. You do need to have disciplinary organizations and affiliations because of the kindred thinking within the discipline and the ability of people to reinforce one another in the development of the discipline. But you also have to set up lots of avenues for people from the different disciplines to work together. I do believe we have them here at Berkeley. We probably don't have enough and there are probably better ways of doing it than some of the things we have here but the Lawrence Berkeley lab, the four governor's institutes, eighty organized research ORUs, the multi-campus research units that exist across the campuses, all of these are ways of bringing people from different disciplines together fruitfully and I think it's needed.



46-00:45:35

Redman:

And you think that we'll see more and more of that?

46-00:45:37

King:

I think that's the way to go to facilitate the advance of knowledge and magnificent discoveries that will retain the stature of the university.

46-00:45:50

Redman:

And do you think that these changes will also happen at smaller institutions, at liberal arts schools?

46-00:46:00

King:

I think they're less able to do that. This is a place where the national lab presence next to campus has helped significantly. Other universities are doing it and if I had lots of time, an interesting project would be to go look at the ways different universities are doing it and do a comparative study and then try to distill some best practices out of it. I don't have that time to do it alone, but a colleague may work with me on it.

46-00:46:31

Redman:

Not having lots of time hasn't stopped you before.

46-00:46:38

King:

[laughter]

46-00:46:39

Rubens:

Is the 2010 multidisciplinary imperative the result of the study that—

46-00:46:46

King:

Yes. I actually wrote a report which was three-quarters along at the time I got pulled into the Hearst Museum and so it went no further. But it had gone so far as to be discussed at a couple of council of deans meetings and has traveled in unofficial form a little. Yes, I drew heavily from that in my thinking for the multidisciplinary imperative. That paper is an interesting one because I did that in connection with an invitation to take part in the Beijing Forum, which is something that China puts on, I think it's annually, maybe it's every second year. But they pick five or six fields and try to bring the world's experts together with people from China in that field. It's done through giving papers back and forth to one another, not by group discussion so much. And one of these was higher education so I was in the position of, okay, what do I want to talk about when the one definition of what it is, is higher education. And I figured this was an important issue and one probably not well recognized in China, certainly not recognized throughout China, so that it would be a good topic. And it did get a pretty good response.

46-00:48:23

Redman:

Have we covered science in the research university?

46-00:48:28

King:

Yeah. I would like at some point to go to the future viability and financial sustainability of research universities, which is another big topic. But until we do that, I'm done.

46-00:48:49

Redman:

I'm happy to speak about that.

46-00:48:52

King:

How much time do we have? [laughter]

46-00:48:55

Rubens:

We have ten minutes.

46-00:48:57

King:

Well, we can start on it. How's that? So that's the other big issue that I recognized as I came to the center in 2004, was the financial sustainability and viability of public research universities. The word research is there because that's what I know about and as I said on other occasions, that's a good place to position the center, is looking at the issue of research universities. It was the issue of the day then and has done nothing but become a more and more and more important issue. What can be done in this sustained decline of public funding for both public higher education but within that the research universities? So I have not been able to find a way to bring faculty from this campus together wanting to research this topic. I continue to look for that. I haven't found it yet, the people who would want to do it. But we did, as the first serious effort on this, take the week of the fiftieth anniversary or the Center for Studies in Higher Education back in 2007. And I did two things with that week, working very closely with John Douglass. One was we put on an international workshop of about 35 people dealing with the future of public universities. And we followed that with a more open conference attended by maybe 200 people on globalization. And I used the fact that the twist we were going to put on the workshop enabled us to draw some speakers who could stay and take part in the globalization conference the following days.

So what we did for the public universities workshop was to create the question of what other countries had done, having had their own situations, their own pressures with regard to sustainability, but having had people who looked at the US as the model for decades. They had learned about the US, what we do. They had gone back to their own circumstances, many of which were tight money circumstances and had done whatever they had done. It was now time for the US to learn back. That was the premise of that conference. It was a good one and we brought some excellent people together and I think there are some fine ideas that come out of there. That would have been the ball that I

would have carried jointly with John Douglas and with Irwin Feller of Penn State, who was our third ringleader and editor on that crisis of the public conference. I would have done that if the Hearst Museum had not come along. The Hearst Museum did come along and then after the Hearst Museum came along the need to build institutes to offer institutes to people from around the world on higher education and thereby gain revenue for the center.

So it's only recently that I've really been able to try to turn my mind back to this. And I've been asked to speak on the subject a few times. In fact, next Tuesday is one of these in an event, the second week of a two week event being put on by the retirement center. But that has made me put thoughts together on the subject and the more I've read the thought the more interested I have become. My life has been complicated a little more by the fact that the chancellor of the Berkeley campus has just engaged me to work with him and the senior administration on issues that pertain to the situation and the changes that may be needed, both in financing of the university and governance of the university, structure of the university. So my mind is very much turned to this. It's interesting. After being at the center for seven years, I finally get to work on what I knew was the most important subject when I came to the center.

So what are my thoughts on this? There is a huge issue associated with the decline of public funding but for public universities in general, and the University of California in particular, this is sort of how I see the arena right now. That for the University of California there's some things that really should be retained virtually at all costs. That is, they shouldn't be lost. One is the one-university aspect of the University of California. The fact that it is one university. And therefore, number two, the fact that it has one budget, not ten budgets. That's important to be retained. Constitutional autonomy which exists for UC is an important thing to be retained, which means as one thinks about this subject, one can't shake things up so much that you have to go back to essentially a new constitutional convention or a new writing of article nine section nine of the California constitution because I think in any such effort the constitutional autonomy of the university would be at great risk. So there are some things that one should not change. The fourth one of these is the public mission. And by that I mean providing access to the best and brightest from California or whatever your state is without regard to their personal financial resources. So those are some things we should retain.

What should we change or strongly consider changing or give a lot of attention to? One, of course, is what are going to be those other income streams, be they private individuals, be they foundations, be they corporations, be they what I'll call entrepreneurial efforts like my

summer institutes here at the center. What are those and how do they best fit into the university and preserve the things we most want to preserve about the university? So what is the best mix of funding to try to go to? And then secondly, recognizing that that mix is not going to be a hundred percent or even a large percentage state funding. That number, by the way, is 11 percent now for the Berkeley campus, state funding as a portion of its budget. It was 23 percent when I was in the office of the president. So that is a big change. But anyhow, given the fact that it's going to be a whole variety of things, I think the top governance of the university has to change in some ways. Right now you've got one hundred percent of the top governance being regents appointed by an essentially political process by the governor, which relates to the state funding. It doesn't relate to the private funding, the need to get donors, the needs to be entrepreneurial. The people who get appointed in that way to the board of regents, this isn't their territory to think about those things. So I think we've got to not necessarily shake up the board of regents but perhaps add on campus specific boards that have compositions that more reflect all the different things that are revenue for the university and obligations of the university. So possibly delegation of some power and function by the regents to these local boards in some way. Those are some of the thoughts.

More partnerships with national laboratories. I think the idea of industrial partnerships has to be rethought with getting into the picture which of the industrial partnerships that serve the university best and its intellectual mission are also capable of bringing in the most income to the university. Now, to date we have thought only the former, what will bring the most intellectual value to what the university does in research, but we've got to start screening these also by do they pay big, do they pay small to the university and find the happy coincidence where something is both good for the intellectual mission of the university and good for revenue.

I do think that the retention of the public mission, the opportunity for all, and thereby being a principal avenue of upward mobility for good and bright people among the population is a very important mission and has to be retained. The trick really overriding all of this is to find the way to achieve that mission with a lot of the revenue to achieve it coming from sources other than the state. Because I don't think the state situation is going to turn around. We can talk about that some if you want but I don't think it will.

Interview 22: December 14, 2011

Audio File 47

47-00:00:00

Rubens: Tell me something about higher education consulting work. Do you do any?

King: There are a number of senior people in higher education who put themselves in play as a higher ed consultant, who go to Singapore and China and wherever and sell your services at a goodly price. I had thought of that but I am sort of a scholar at heart and the way to combine that side of myself with all of this stuff I had done in administering higher education is what brought me here to the center.

47-00:00:31

Rubens: Yes, I remember your very clear discussion about that. And then in the meantime you do get to do some consulting with the University of Armenia and these—

47-00:00:44

King: That's entirely uncompensated. Armenia is entirely uncompensated.

47-00:00:53

Rubens: Your expenses are covered?

47-00:00:55

King: China, I would say, the national lab that I just went to for three days in November, that's modestly compensated. And I stopped doing all other consulting, all private consulting, I was with Proctor & Gamble, as we've discussed, for years and years and years. I stopped doing that shortly after I became provost of professional schools and colleges because it seemed to be getting a little towards a conflict, a conflict of interest, and there were people who would be poking around and look at your bio bib and see what you did and I didn't particularly want to be defending the fact that here I had consulted for—or was still consulting for a face powder cosmetics and dish soap company.  
[laughter]

47-00:01:58

Rubens: I think we'll revisit that perspective when we have a wrap-up session. Today we are going to cover policy issues in higher ed from your vantage point at CSHE. 2009 is a really big publishing year for you and you're the board chair of, the National Academy of Engineering, the chemical engineering section.

47-00:02:52

King: Yes, I did that.

47-00:02:53

Rubens:

In 2009, you leave the Hearst Museum. It's a big year. And then the executive institute starts—

47-00:03:05

King:

The first were in 2010. In effect I got out of the museum, discovered I really did have a financial problem here [at CSHE] and made the basic decision to try to address it through the institutes rather than through going on bended knee to philanthropists.

47-00:03:28

Rubens:

I'd like to formally start the interview with hello and good to see you, and that this is the twenty-first interview on the 14th of December 2011 and it's tapes forty-seven and forty-six. So these are the things that I think we'll cover today. It'll no doubt fill the time. And then we will get the transcripts to you, as I wrote, and you'll review them and decide how many edits. But there may be areas that both Emily and I decide as well that need a little more in-depth. You may think of things that we should have covered and instead of writing it out we'll tape. And then I do want to definitely have a sort of macro perspective. Particularly about the large scale changes that have occurred and from your vantage point of having done all these studies, especially the impact of globalization.

47-00:04:40

King:

I think that'll be very good. I like it for one reason because the last thing I did before coming here was to sit through a faculty meeting of the Department of Chemical Engineering and they were discussing exactly the subject that I started my administrative career with, which was distributing the graduate students among research director faculty members and how to do it. And boy has that changed over the years. [laughter]

47-00:05:13

Rubens:

So maybe should we start with the institute, then? That you conceived of it as a—

47-00:05:29

King:

Oh, sure, fine. So I had started with the Center for Studies in Higher Education in 2004, when I came back from the provost position to the Berkeley campus. And I had gone off to the Hearst Museum spending most of my time on those issues from September of 2007 until I think it was December 1, 2009. And as I got back being able to pay full attention to the Center, it became apparent that we had very substantial budget balancing issues and they resulted from two things. One is from a misunderstanding before I got here with regard to the use of monies that had been designated for the use of the ex-presidents but had been built into the Center's budget. We had two ex-presidents with the center, Clark Kerr and David Gardner, so the funding for them had

been built into the budget. And Kerr passed on and Gardner wanted to spend his money. That was part of the budget problem. And then just the series of cuts during these last four or five years of very stringent budget situations for the University of California. So I came to that and I considered two paths for trying to do something for the Center here. One was a development operation, i.e., fundraising. Just private fundraising. And the other was to give courses in some way.

So to take care of the private fundraising first. That is very hard for an individual small unit to do because development is very decentralized on the Berkeley campus. The central office in effect provides support services of various kinds but the units all have development directors. The school of business, college of chemistry, et cetera, et cetera. And the function is done at the center level—at the unit level. So who did I have at the Center who could support me with regard to development and the answer is really no one. Before going to the Hearst Museum I had done some looking into that route and working jointly with Pat Pelfrey, who was the closest I can come to somebody who would understand development.

47-00:08:03

Rubens:

Pat Pelfrey had been—

47-00:08:04

King:

She had been for five consecutive UC presidents, on the immediate staff. So she knew what was going on. So she and I looked into it and I actually tried to pursue an idea of seeing if I could get a class gift designated to support the Center and name it [the Center] for Clark Kerr. Here was the logic. That Kerr's presidency was fifty years ago and that the class gifts had been designated for particular purposes and if a class wanted to tie its gift to putting Kerr's name on something, this would be a good thing to put it on. So we pursued that a little. We could never get what I would call distilled contact information from the development office. I did at one point get a sheaf of about a hundred pages worth of about fifty names per page but what could I do with that? And so I really came to the conclusion that development was going to be very hard to do in this small an operation.

47-00:09:27

Rubens:

I just thought it was a very smart idea, what you were doing, and I wondered if some money would have come as a result of his death.

47-00:09:34

King:

No. The one thing that came as a result of Kerr's death was Kerr's collection of books, which we have on a set of shelves at the other end of this room and it is wonderful to have. But there's really been no development operation ever for the Center and it's not clear how we would do it if we didn't do it through some mechanism like that class

gift. So the other thing that steered me away from that is that as I started seriously looking at the class gifts, the decision was made by the campus no longer to focus class gifts. Class gifts, as of that decision, now are for whatever the donor wishes to give them for and it's not for a single thing that is funded off of a class gift. So you'll find no more Pappy Waldorf statues funded by the class of whatever.

47-00:10:23

Rubens:

Or the north entrance to the campus.

47-00:10:26

King:

There are many of these. The north entrance to the campus was indeed one, yes. So then I hit upon the fact that we were really beset by foreign delegations that end up at the Center because they want to find out what American higher ed and UC and California higher ed are all about. And these would come either by direct contact to the Center, or there is an international visitors center on the Berkeley campus and we were probably the most popular destination for the people who came into them. So we still do get a lot of such visitors, by the way. But I figure given this large amount of interest, and the questions were always the same, in various forms they were—the University of California is wonderful, it's a great accomplishment, we want to be like that, how do we do it?

So, okay, I got up an institute or week long course around that sort of topic. So we got ourselves together in the Center and I think designed quite a good course. We did this in the fall of 2009, as I was coming back from the Hearst Museum, and we put together a set of subjects that came under four headings. One, the American research university and what it's about. Another, California's higher education and the master plan. A third, the University of California, what it is, how it works and how it became successful. And the fourth, to take advantage of our geographical location, technological innovation. University roles in technological innovation and economic development. So that, of course, was blending with Silicon Valley and the birth of the biotech industry and such things.

So we put together those curricula and for the first summer we actually created two courses. They shared common material for the first half of each and then the first of these, which I call the Clark Kerr Institute, went deeper on how UC runs itself. So things like academic personnel policy and faculty reviews in UC. And the second one went further on technological innovation and we called it the Glenn Seaborg Institute. So an interesting thing is that we had to learn everything from scratch in doing this. There is no central office of services on the Berkeley campus where you can go to with how do I run an institute. You have to discover it all yourself. And so we did some things the hard way.



And so we had to look at the lodging, since we wanted them all to room together. We had to look at where to get meals. We had to look at a room to hold this in and how to secure that room and then we had to put together the entire curriculum. And I did the curriculum that first summer with people from the Center and with good friends of the Center like Neil Smelser and Karl Pister. I believe I had Carol Mimura, who heads the industrial relations office on the Berkeley campus as part of it. And I had Steve Arditti come down for a part on state government relations. So we did not draw marvelously that first summer. We got, I believe, it was four people for the first institute and six for the second.

47-00:14:22

Rubens:

That's tough. Had you decided what would be an ideal number to make money but also cover expenses?

47-00:14:28

King:

Yes. I would like to go to twenty or twenty-five on these institutes and I think that's a good combination of being a workable size still and yet being able to make money. I looked at a few other things around the country, such as the Harvard courses that are given in the summer on higher ed and came up with a price tag of \$7,000 for the international people, of which 2,000 would be used for lodging and the various meal events and room rentals to the extent we had to do that and the other 5,000 could be used for various other purposes, including some profit to go into the budget of the Center. But one of the things I had to do was get somebody to run this because it's a very big job overseeing a course like this, putting it together, making sure all of the logistics are taken care of in the right way. And so I was exceedingly fortunate that Ellen Switkes became available. She had been at the office of the president all my time there. She had been for many years, more than my years, many more than my years, the assistant vice president for academic advancement, which meant the oversight of the academic personnel manual and all academic personnel issues that would come up to the—either the office of the president or the regents. And Ellen had been working with Haile Debas at UCSF on a global health initiative.

And that project had in effect concluded what needed to be done in the way of preparatory work for it and so Ellen was available and I was very fortunate in getting her interest and services for this. So she joined us, now needing to be paid out of the program because I had no independent source for her, on a recall appointment to be my strong right hand in overseeing these activities. So we drew very modestly the first summer. We in hindsight would have done much better to have had one institute and all ten people together in it. We then learned a bit about marketing after that.

We consulted with the people who do the executive education program in the Haas Business School and I looked at how Harvard markets their summer courses and learned some things about how to do it. So the next summer, which was 2011, we drew nineteen people, of whom thirteen were from overseas and six were from within the California—within the University of California at a much lower rate. For one thing, there was no need to give them room and board and we also made the tuition part lower as sort of a service to the university. And I got a number of people there from within the university to make me think we can do much more within the university.

One I remember from last summer was a young woman, Tina Brock, who was brand new as associate dean of the school of pharmacy at UCSF. She didn't know the UC system. She didn't know how things worked in California, so this was idea for her and she really liked it. We had a couple of people from the office of the president who professed similar interests. The Haas school apparently gives their senior staff rights to go to one course per year somewhere. Two of them chose to come to this as their course and it worked very well for them. So I believe we now know more about marketing and our market is not just overseas people, which was the initial market I saw. Back off on that. The initial market I did see was countries that were hungry to find out about US higher ed and I had in mind the Mideast, particularly the Arab countries, and I had in mind China. Well, I've never gotten anybody for a summer program from China and the reason is the degree of comfort with the English language. So we've gone in another direction for China. But I believe that the market for this is not just the rest of the world. I think it's also the rest of the United States and I think it's within UC. So that's what we're looking at going to the future.

I have also done dedicated versions of those institutes. One, and I had thought until recently, two. We did one a year ago for a university in China that exists as a university for the sole purpose of educating university administrators. So it's a university of university administration.

47-00:19:32

Rubens:

How smart.

47-00:19:34

King:

And they sent a team, presidents and vice presidents, and chairs of the university council from Chinese universities and that one we did with translation, sequential translation, and much the same cast of characters, although I started bringing in other people to augment the faculty. We've always tweaked it a bit as we've gone from one to another. One of my best instructors right now is Paul Gray, who used

to be the executive vice chancellor of this campus and who is now retired but not really retired.

47-00:20:15

Rubens:

And took over something from you in the National Academy of Engineering?

47-00:20:19

King:

We've worked together on the National Academy, yes. We were both at a meeting last summer of a committee he chaired and I was on with regard to what the Academy should be doing in engineering education. So the Chinese one worked really well and I had another one for this very week that we're in right now that was arranged through an intermediary with the president of the National Examination Authority in China. That person is a very high official of the ministry of education and has responsibility for the exam that one takes as a junior or senior in high school and which determines your entire future. It determines where you can go to college and what's open to you after that. So a huge, huge role. And he was to assemble twenty Chinese university presidents and vice presidents to come. This was all set and rolling along and it fell victim to the demonstrations on the Berkeley campus the week of November 9th, and it was after the most severe day of those demonstrations, where there had been the action by the Alameda County Sheriff's people with the billy clubs. And when there had been the very unfortunate shooting by the police of a deranged intruder on campus. The very next morning we got the word that the Chinese were pulling out of this institute because they felt the Berkeley campus was unsafe. One can speculate whether the reasons might have been something else but that was the reason they gave. So I'm reeling from that punch and getting ready to come back.

47-00:21:59

Rubens:

I bet. Is there a kill fee for that? Had they given deposits or—

47-00:22:08

King:

They had no deposits and I was working without a contract because I didn't know how to enforce a contract with China. And I had spent \$25,000 out in front and was looking to realize profit, if you will, of 50,000 out of it. So there's a \$75,000 on that out of a budget of \$400,000 for the Center. So it's big business.

47-00:22:33

Rubens:

Oh yes. How about the Middle East? Did that ever prove—

47-00:22:38

King:

Well, I've gotten individuals from the Middle East. Not just one but three. I had a professor from a Saudi university who missed most of the course but came to the last two days of it. That was one of the ones in the summer of 2010. I had another professor last summer, a woman,

who was a professor of education at the King Saud University in Saudi Arabia. This is an interesting story because that's not a women's university and things are very divided in Saudi Arabia between the sexes and here she was, a professor at this quite old university in Saudi Arabia. Very interesting!

47-00:23:30

Rubens:

I was going to ask you if this is a primarily male—

47-00:23:35

King:

No, we've gotten women and to talk about the variety, last summer brought quite a few different ones, too. We've had a woman on a star career path, so to speak, from the ministry of education in Singapore. She came last summer. She's about thirty-five, I would estimate. The way Singapore works, she has her whole career laid out for her. She is one of the chosen, back from her early career, so she knows she will be doing such and so now. Then she knows the next job, and then she knows the next and they go right up to the top in the ministry of education in Singapore. So she was one of them. I've had a registrar, which is a faculty role in the British universities. A registrar from the Chinese University of Hong Kong. I have had an associate vice chancellor from one of the universities in Taiwan. I had the ex-president of the University of the Basque Country from Spain. I've had a professor from the Royal Military Institute of Sweden who chose to do this just as the one course he would take somewhere that he was able to do per year. I have had three women last summer from the ministry of education of Botswana. And it goes on to reach the appropriate numbers. So it's a very interesting collection.

47-00:24:59

Rubens:

So your marketing also has to be quite broad.

47-00:25:01

King:

Our marketing is getting better and better and I feel confidently that this year we will be able to get to something like twenty-five or so with regard to the enrollment in the course. And if we do get more from within UC we might even be thirty. So—

47-00:25:22

Rubens:

Do you have any specific marketing vis-à-vis the whole UC system.

47-00:25:28

King:

We're starting to work on it. That's come in an interesting way because the first summer we decided just to invite Mark Yudof, Larry Pitts and Bob Birgeneau/George Breslauer to name somebody to come for free to the institute. And we did get somebody. It was very good for the institute. Beata FitzPatrick came and she's assistant chancellor—or associate chancellor maybe it is—and is one who came with Birgeneau from Toronto. She is quite a central person. It was

very good for her to learn this about the UC system. That was a very positive experience. She's now an affiliate of our center as a result of this. So we started that way, just sort of do something nice for the administration. Then we saw that there was more of a market than that, so we marketed it last summer for 2,500, which I think is less than cost. That price was set because we did not have to spend the room and board money for anybody who came from the Bay Area. So we're now marketing this summer at 3,000 for UC people and we're going to market through all deans and all provosts and all chancellors of UC campuses. We're going to do the same for CSU and we've not done that before. And we're going to try to reach other US universities, probably through the AAU and through what used to be NASULGC [National Association of State Universities and Land Grant Colleges] and is now APLU. It's the public universities.

47-00:27:18

King:

NASULGC was National Association of State Universities and Land Grant Colleges.

47-00:27:32

Rubens:

Then is that what you're having this March?

47-00:27:37

King:

We're having something different in March. That's another activity and it's an interesting activity and it's an entirely different one. So this one is service and I've changed my mind recently and think it can be a substantial money maker. This one is a joint project with the American Association for Hispanics in Higher Education [AAHHE]. That's an Hispanic group of educators who have gotten somewhere in higher education administration. And how did I link with them? Well, the way I linked with them is that I was found by somebody who had been an eighteen year Berkeley campus employee and then was on the board of AAHHE and that's Josie Baltodano, who had run the McNair Scholar program here at Berkeley for many years. She then went off and was a vice president of Alliant University and John F. Kennedy University, and then was for three or four years the president of Marian College, and I think it's now Marian University in Fond du Lac, Wisconsin. She's back here and she came in and has in effect made herself available to the Center and promoted the idea of a course that would be joint between the Center for its academic strength and expertise and AAHHE for links to the multicultural world and also for links to faculty.

We put two themes on that institute, which we did for the first time March, a year ago, 2011, in San Antonio right out in front of the annual AAHHE meeting there, across the alley from the Alamo, so to speak, which is exactly where the meeting was. And we put two themes on it. One is that higher education is changing greatly. First of

all, we pitched it to people who want to be presidents or provosts. For whom that is within their career ambitions. And so two themes. One is that higher education is greatly changing. What the changes are and what colleges and universities and university administrators may need to do to adapt to those changes. This is things like the internet and global communication and universities that cut across state and national boundaries and so forth. And then secondly the fact that university administrators need to be able to deal effectively with management in a multicultural world. So there students will be multicultural and their faculty will be multicultural. And what about that? And that's where the AAHHE side of the equation came in, because I got a number of people with strong backgrounds in that, through them. So we gave this the first time to a group of twenty-eight in San Antonio and it is now going to be held at Berkeley at the Kerr campus the spring vacation week, the last week of March 2011. We are gunning for about forty to come here for what will be four days and we have at the moment something like twenty-five, which is not bad for what was really December. I guess it's now mid-December. But I think we're quite likely to make the forty. We do this on a revenue sharing basis with AAHHE. AAHHE provided a lot of the onsite organizational services for San Antonio. We are providing them here at Berkeley with the Kerr campus. So that's an entirely different endeavor aimed at a different audience.

47-00:31:58

Rubens:

That's smart.

47-00:32:00

King:

It, too, has drawn some UC people. We had a vice chancellor. The vice chancellor for student affairs of UCSF was one of our people last summer. The other associate chancellor for the Berkeley campus will be one of our people this summer, Linda Williams. This spring, rather. So that's working well. Now, to put these two things together. We were also approached by Mark Yudof and Larry Pitts as to whether we might do something special with regard to training high level people in the UC system. And I went through conversations with Larry, who then sent me to campus vice chancellors, the academic vice chancellors or provosts, to talk about what we might do. It would combine our institute on UC and American higher ed with the institute on leadership qualities, which is the second one and put on something for the UC system. I've come out of all of that with the conclusion that we don't need more to do and that for both of these institutes UC is fertile marketing grounds. So that's how we'll do it, rather than yet again a third something for the UC system.

47-00:33:22

Rubens:

Who's Larry Pitts?

47-00:33:24

King: Oh, he's the current provost and executive vice president for academic affairs of the UC system.

47-00:33:32

Rubens: Oh yes. Boy, these seem just marvelous. Okay, so you could—

47-00:33:39

King: Yes, you could do wonders here. The real issue, here's this little bitty center, how much can we do it. Because a very large amount of my time is going into this. All of Ellen's time goes into it. And a goodly amount of Rondi's and Christina's time goes into it.

We're now modeling Harvard with regard to the fee and fee refund situations so that we can recover if people do cancel out.

47-00:34:33

Rubens: And nobody from Armenia, by the way?

47-00:34:34

King: Not yet. And I've tried. [The new Provost of AUA did attend summer 2012]

47-00:34:36

Rubens: So just to get the nomenclature clear for this interview. The executive leadership academy—

47-00:34:49

King: That's the second one. That's the one joint with AAHHE.

47-00:34:51

Rubens: That we just talked about?

47-00:34:52

King: Yes.

47-00:34:52

Rubens: And then the summer one is called the—

47-00:34:54

King: Is BIHE. Berkeley Institutes on Higher Education is the name of the entire other program and then within it we may give names to specific institutes. We've been giving the name the Clark Kerr Institute to the summer one.

47-00:35:10

Rubens: Right. And Seaborg was a—

47-00:35:13

King: Seaborg was a one shot offer, a different agenda with the summer one.

47-00:35:17

Rubens:

Do you feel at the moment you've said enough on the institutes?

47-00:35:28

King:

Oh, yes. Sure.

47-00:35:28

Rubens:

Something more may come to my mind that we can include. I do want to point out is how much research and publication the institute had done, and then you yourself had done on policy issues in higher education, particularly globalization.

47-00:35:44

King:

Yes.

47-00:35:44

Rubens:

Globalization's Muse, and edited volume is published. But what is interesting to me about it is that was a result of two symposia or conferences.

47-00:35:59

King:

Yes, and I should talk about them. And then we do also have what is called the Research and Occasional Paper Series, that acronym works out to ROPS, of the Center for Studies in Higher Education. John Douglass serves as the editor of that. And we will post electronically on the website in that series twenty papers a year maybe.

47-00:36:23

Rubens:

That's a sizable number.

47-00:36:24

King:

So that's quite significant and that's become a well-recognized resource in the higher ed world. That's a good product.

47-00:36:34

Rubens:

There is quite an evolution, development, breadth of the thinking and the writing between '98 when you do write about the role of the research institution—

47-00:36:45

King:

Yes, which wasn't very deep.

47-00:36:47

Rubens:

Well, all right. But you were pointing to things. But really the whole ballgame is different ten years later.

47-00:36:54

King:

Yes. Oh, so totally different. It's a very fast moving field, the study of higher ed, and of course accelerated all the more by the very severe state that the public universities find themselves in now and all the changes that occasions. It's really multifaceted and multi-dimensional.



Let me tell you what I've done this morning, which will give you an example of how multifaceted it is. I started off as part of a small group meeting with the UK minister for universities and science, who's a member of David Cameron's cabinet in the UK. And this minister was very interested in California higher education. Knew a lot about it. Somebody had boned him up very well. And wanted in particular to understand the approaches that UC and Berkeley are taking in this present very severe financial situation and what we see as the future. So I spent two hours on that, including bringing the minister and his people back here to this room for the last half hour. And then I go from that to a telephone call from a reporter from the Harrisburg, Pennsylvania newspaper who wants to talk to me about the problems and needs of public universities, and in particular what situation Rodney Erickson will face as he has now become president of Penn State following what happened at Penn State during the last month. So it's amazing what you get into here. So I had a nice conversation with him for about forty-five minutes.

47-00:38:52

Rubens:

Yes, what you get in to but also the platform that you've created. It may still be small and struggling for money but the amount of output and resources is pretty amazing.

47-00:39:01

King:

Yes. In the world of what research is going on in higher ed, this is big, strikingly so. There's amazingly little study of higher education itself in the US. More in the rest of the world. But still not a lot.

47-00:39:19

Rubens:

So how do Carnegie and Spencer come to support—

47-00:39:26

King:

Well, Carnegie, of course, is the way the center started. The Center stated with Robert Gordon Sproul and Clark Kerr taking a proposal to John Gardner when he was the president of the Carnegie Corporation of New York. And that was fifty-five years ago. So 2007 was the year of the fiftieth anniversary of the Center and we decided to take a week and do two things in that week. One is just hold a general birthday party or a big celebration in the form of a daylong conference, and that conference was on the subject of globalization in higher ed, picked because it was a subject we knew was very important at that point in time and secondly because it was of strong interest to Carnegie and it was Carnegie that we went back to try to get some money to support that event. And we did, a discretionary grant from the Carnegie Corporation.

Then we decided let's have a second event right before this. So globalization would be the second event. And the one that would

precede it would be a workshop of thirty-five people on a subject that we named the Crisis of the Publics. And this was generated jointly by John Douglass and me, along with Irwin Feller, a long-time colleague of mine who deals with science policy and research universities. Both of these were generated jointly by John Douglass and me. And the idea of the Crisis of the Publics was to follow a particular line of thought and that line of thought was this. That for decades the rest of the world has held the American higher education system in very high esteem and we have a sequence of very frequent visitors from all around the world trying to find out about American higher education so that they can—I won't say replicate it -- in their home countries. So that they can take good features of it and incorporate them in their home country and adapt the model to what their home country is and what its limitations and situations and opportunities are. And that's been going on for a very long time and many delegations have come through. So we decided that our theme would be to take the fact that that has happened and say now is the time that the US is getting into trouble with its public universities, to learn back from the rest of the world what is it that you have done after looking so much at the US systems and instituting whatever you've chosen to institute in your home country. What can we learn back from you? So that workshop had an attendance of about thirty-four people and they were half from overseas and half from the US. That was very, very stimulating and I think successful. The book is a compendium of papers, mostly from the workshop, some come from the globalization day that followed.

47-00:42:45

Rubens:

Oh, it was two days in a row.

47-00:42:47

King:

No, we did the workshop for—I think it was two days and then we did the globalization full day complete with dinner on the third day.

47-00:42:59

Rubens:

How many people were at the globalization day, about?

47-00:43:02

King:

Probably about 200. We held this up in the Lipman room on the top of Barrows Hall.

47-00:43:13

Rubens:

It was called “a reflection and prospectus on globalization in higher education”?

47-00:43:18

King:

Yes.

47-00:43:19

Rubens:

And one of them was in association with BRIE, the Berkeley Roundtable on International Economy.

47-00:43:26

King:

Yes, that's true. That was the first one. And we have worked closely with BRIE. The principals there have a lot of interest in higher ed, two in particular, John Zysman, who is, I believe, one of the founders of BRIE back with Laura Tyson. He's department of political science. And then Martin Kenney from the Davis campus is very interested in the economics of higher ed and of technology transfer and technological innovation and he too is a principal of BRIE.

47-00:44:06

Rubens:

What do you call BRIE? What category describe it? What does roundtable mean? Is it funded or is it—

47-00:44:17

King:

This is a very good question. Yes, it's funded. They have funds and I don't know from where but it's probably foundation or possibly corporations and possibly overseas. Stephen Cohen, Laura Tyson and John Zysman were the three founders.

47-00:44:36

Rubens:

Steve Cohen from City Planning?

47-00:44:45

King:

So they certainly have a lot of publication that comes out of BRIE. They have workshops and conferences. I have participated in some and I think that's what it amounts to. It's an intellectual home for people with those interests in the international economy.

47-00:45:05

Rubens:

Oh, I see. There must be other models of that on campus. I just can't think of them.

47-00:45:12

King:

There are other centers that deal with the economy and with international economy.

47-00:45:16

Rubens:

So it's not officially called a center. They call it a roundtable.

47-00:45:23

King:

Yes. Well, it's very policy oriented. There's one reason it is called a roundtable, which—and is not called a center with a capital C or called an institute and that is that a center with a capital C, an institute, are controlled titles.

47-00:45:45

Rubens:

Controlled titles?

47-00:45:46

King:

On the Berkeley campus. Controlled. To have one of these you've got to put in a proposal to be an organized research unit and it has to be reviewed by the senate and all of that and it's a process of more than a year. So there are people who want to get going sooner than that and so the way you do that is have something and just give it a name other than one of those controlled words.

47-00:46:10

Rubens:

Were the multi-disciplinary, integrative programs, for example CITRIS and all of those initiatives, a model for what you were doing at CSHE?.

47-00:46:44

King:

CITRIS. Yes. Governor's institutes on science on and innovation have been part of the lure. The fact that there are successful large scale multidisciplinary research operations has been part of the lure. But I think the lure is other than that. I think there are two reasons people keep coming here, two prime ones. One is the name and history of the center, which has a lot to do with people like Martin Trow, who was a world renowned scholar of higher ed and who was director of this center for something like twelve years and very much built the worldwide reputation. Sheldon Rothblatt had a significant part in that, too. So between the two of them they gave us quite a worldwide reputation whereby we are thought of and recognized. That is one thing. The other is more pragmatic. It is that when a country like China, that I'll take as an example, chooses to look at the United States and decide what it wants to emulate, they first—when China first started looking at the US they looked more at the private universities. Then they realized that's not what they have in China. They have public universities. And so you want to find the best public universities and if you can find one that has a center for studies in higher education, why, that's the perfect match. And so that's what brings them here. So we got some by our own reputation and some by the fact that it's Berkeley and Berkeley is what it is and here is a center that studies the kind of thing that Berkeley is.

47-00:48:28

Rubens:

Well, obviously it's expanded but you really expanded it in terms of visiting scholars, the number of research papers that are produced and put on line, the broader scope

47-00:48:40

King:

And breadth of mission I think is the other one.

47-00:48:41

Rubens:

The breadth, yes. Just the topics that are in Globalization's Muse is really quite impressive.

47-00:49:01

King: And there is a lot to be learned there.

47-00:49:01

Rubens: How was it received?

47-00:49:03

King: I would have run hard with that ball if it had not been September of 2007, the year that—these conferences were in the spring—that the chancellor found me for the Hearst Museum.

47-00:49:25

Rubens: The word I was looking for earlier literally comes out of the introduction, that you write: “Convergence, competition and congruity of policies and practices.” That seems to be to be what we see here, whether it’s technology or administration or—

47-00:49:43

King: Yes. That’s a good example of the sort of thing the Center tries to do. We’re not so much research per se but more policy studies. And these studies can be done in a public venue and be published in the ROPs series or John Douglass has his two very well recognized books, one on the master plan and the other on the conditions of admission to public universities. No small topic. And so we do studies of that sort. And not a lot of it would be called pure research. I think Diane Harley gets the closest to pure research, social science research. But even that has got a large what works best overtone to it and therefore a policy overtone.

47-00:50:49

Rubens: I mean to ask you who was Carolyn Mimura? Head of industrial relations on campus?

47-00:51:16

King: Berkeley has done an interesting thing there and that’s why she was significant as an instructor. We’ve talked about the history of tech trends within the University of California but something that started off as just patents and licensing and just moving the technology out there has become much broader and wider on the Berkeley campus. First of all, I think we talked about how the system devolved the licensing role to the campuses. But the other thing is that there are many ways in which the campus interacts with industry where patents aren’t that important and where thinking about it solely from a patent and licensing standpoint is almost immaterial, if not inhibiting. And so to put the function of licensing together with a function of enhancing general relations with industry was I think a brilliant stroke and that’s what Carol’s office is now.

47-00:52:23

Rubens: And where is that office located? Under the office of the—

47-00:52:39

King: Oh, comes under the vice chancellor for research.

47-00:52:46

Rubens: I'm surprised you didn't cancel the institute with only six people in attendance. It wouldn't be good p.r.

47-00:53:01

King: I had committed to these institutes. And so I will then value the learning experience that comes from running it.

47-00:53:10

Rubens: Sure. And back to your budget for the Center. You talked about the problem posed by supporting presidents. How is that—

47-00:53:29

King: Well, it was the way that money had been built into the budget was the problem.

47-00:53:32

Rubens: Who had built that in? How did that—

47-00:53:33

King: Well, the university for years had a policy that ex-presidents would receive 50,000 a year to do ex-president things. It might be used for travel, it might be used for hosting a meeting or whatever. And each one of the living ex-presidents would get that. Clark Kerr's money had been built into the Center because Marion Gade, who was his close, close co-worker and a co-researcher, just did everything with him. She was an employee of the Center and so her work was done through the Center. So Kerr's money, I'm not exactly sure of the history, but I think it probably had been built in here for the employment of Marion Gade. David Gardner as the next president received money and through a misunderstanding in the allocation of it, that money had been run through the Center, which makes sense because that's David's primary affiliation with the university now, and had however been built into the budget of the Center. It had not been reserved for David Gardner. That was the misunderstanding. David Gardner is supposed to have money and has needs for money and there it was as part of the Center's budget. That was the problem.

47-00:55:01

Rubens: Could we label this perks for the past presidents?

47-00:55:05

King: Oh, you could, I suppose, but you want your past presidents doing things for the university. They are a valuable asset. And actually, that whole policy was changed back in 2007 maybe, when it was discovered that the past presidents had accumulated balances. They had not spent out every dollar they'd received each year. The decision

was made to reclaim the balances. So that was money out of our budget, too. And to switch it to a cost accrual accounting, may be the word. In any event, not just simply to send 50,000. To let them incur up to 50,000 per year and then the demonstrable expenses that had been made that year would be sent down to OP and would be reimbursed. So instead of having 50,000 a year for ex-presidents in our budget we have instead the right to accrue expenses and then get paid after the fact.

47-00:56:12

Rubens: And what about your good friend Atkinson?

47-00:56:14

King: His is from San Diego.

47-00:56:17

Rubens: Oh. So they choose?

47-00:56:20

King: They affiliate somewhere when they leave. David always affiliated with the Berkeley campus and chose the Center as the piece of the Berkeley campus he wanted to affiliate with. I don't know where at San Diego Dick Atkinson is plugged in but it is there in any event. And Peltason at Irvine. He had been chancellor there.

47-00:56:52

Rubens: You mentioned to me off camera that former Chancellor of Berkeley Robert Berdahl was to join CSHE.

47-00:56:59

King: He was going to be here. And he got spirited off to head the AAU and he did that for the requisite number of years, which was something like five or six. Has left that position. Decided to settle in Oregon, which they've loved as a past home but still would affiliate with the Center. Two things have happened to him recently. He got engaged as a two day a week special assistant to the president of the University of Oregon. Who then got dismissed about two weeks ago for being accused by the state board of education and the legislature as not working well with them. And Bob Berdahl wrote an op-ed piece condemning that action in one of the Oregon newspapers and despite that is now the new president of the University of Oregon. It may be acting president but he's that as of two days ago. So I'm not getting him back to the Center soon. [laughter]

47-00:58:23

Rubens: Good for him. They're lucky to have him I think.

47-00:58:27

King: They're very lucky to have him. It's despite his defense that he became president. [laughter]

## Audio File 48

48-00:02:42

Rubens:

So in general, to what extent have you articulated new directions for, the center in balance with continuation of prior policies.

48-00:03:25

King:

Well, we do for the senior researchers run it much like the university would with professors. That is, they define their research. They're expected to define their research. Two of the three of them are in the professional research series which says that their research is done much like faculty professor research and they're judged on their creativity and their output. So it's not different from the rest of the university research world in the fact that they self define what they do. I'm not in the business of telling them what to do. So therefore, my ways of modifying or expanding what the Center does are twofold. One is what I can start in the way of initiatives and the other is what I do myself. So do it yourself has been one part of this and that has been primarily the engineering education endeavor and thinking about the public university situation for the future in many ways. I'm quite comfortable looking at that, including a big part of that being the work that I'm doing with the chancellor now.

With regard to new initiatives for the Center, the institutes would be that and I did search for new initiatives when I came here as well—I think I probably described this in an earlier interview. I wanted to find out what resources I had on the Berkeley campus so I had lunch with a large number of people over in the faculty club one by one by one to see what there was that I could build an initiative around. So I bear at least 50 percent of the responsibility for the institution of the initiative on scholarly communication. We did discuss that earlier, which Diane Harley took on totally as of when I went to the Hearst Museum and has done very well with. So that was finding a new area of extreme importance to higher education that we could work with.

The thing I would like to do, given more time at my disposal, and I don't know when and how that will be with these institutes, is to go out once again among the Berkeley faculty and try to put together some initiatives that will truly draw in Berkeley's faculty intellectual expertise.

48-00:06:17

Rubens:

That had been an original goal of yours and—

48-00:06:19

King:

That was an original goal when I came. It was something Martin Trow told me I wasn't going to be able to do. And, of course, he had spent his twelve years of frustration on that, I suppose. But I would like to



try again on that. Particularly, the one I'd like to do it on, is the question of the sustainable future for public higher education, and maybe within that the research universities in particular, because it is the issue of the day, where there is pertinent expertise on this campus.

It's in pieces here and there. It's not well put together and I think with some effort, perhaps starting with a seminar series or a study group series or something like that I could put something together that might indeed work on that. It's got a characteristic that I think is important for achieving that kind of end and that characteristic is that faculty really care about the subject right now. That's what worked on scholarly communication at the time we were having all of the hubbub on Elsevier contracts and library costs. Well, certainly the financing of public education is of interest to the faculty now. Has to be right on the front burner. So if I could generate the time, that's something I would be interested in doing. There's some other things I want to do if I can generate the time and they're quite different from that. And one is to write a book. I've had that on my agenda since I first came here. And I've gone so far as to list the titles of fifteen chapters.

48-00:08:04

Rubens:

And the focus would be on?

48-00:08:08

King:

Well, I thought when I came here there were two things I could write on. One was that there are a heap of books about being a university president. They're all over the place. There are very few books on being a university provost. So that was a possibility, particularly since I've done different things that have provost in the title. The second is just to take what has sort of de facto been my principal field of scholarship and study since I've been here, because of the institutes and other things, which is what are the reasons for the success of the University of California. And not do a history of the University of California but instead just simply try to collect and present and analyze those reasons why it was able to become the number one public university in the world with a characteristic that in relatively very few years it could spawn extremely strong new campuses. That's of interest to a lot of people how that happened and it's that latter one that I would write on if I could get myself going.

48-00:09:24

Rubens:

No one else does that, really, right?

48-00:09:29

King:

I don't know of anyone that has done it. Neil Smelser has a new book that recently came out. It's sort of vignettes. It's about twelve chapters of different things he participated in during his career with UC, governance related issues, other issues. But it's not pitched towards the

reasons for success. No, the only things I know of that are precursors that exist to that topic are a piece by David Gardner in his memoir, *Earning my Degree*. He has about two pages that try to list the elements that he feels are most important to the success of UC. One of them is constitutional autonomy and on and on through some others.

48-00:10:22

Rubens:

Pelfrey summarizes that in one of her pieces.

48-00:10:27

King:

Pat. You're right. There is a third one. Pat does do that in the brief history, the little book. And the other thing David did was a slightly more expanded job of what he put in his book, exists in a lecture that he gave at the University of Illinois at Chicago three or four years ago. That's all I know of on the subject.

48-00:10:53

Rubens:

Boy, would that be a useful in a course in your institutes.

48-00:10:59

King:

Well, I'd like to do it, yes. But that's no small job.

48-00:11:01

Rubens:

No, it is not a small undertaking. You'd need some research assistants.

48-00:11:11

King:

Yes, I would need some assistance. To the extent that the reasons for the success are people as opposed to institutional things, I know some of the important people well enough and I know where to go to learn more about them. Lewis and Lawrence are examples. But I don't know it for many of the other disciplines. In order to look at the people who built UC, you would have to look at everything. You would have to be off in the humanities and the social sciences, et cetera. So I'd like to do that one.

48-00:11:52

Rubens:

I'd like to revisit the first one. When you say there's nothing on what a provost does, how are you assessing what a provost is? How are you describing that?

48-00:12:06

King:

Well, so what leads me to this is that I believe the university world has over the last fifty years gone from where a provost might have been just a strong right arm of the president and everything the president did to where the two jobs are very, very different. I think we did talk about that some before but we can go deeper.

So now the world has gotten to where the university president job is very external. For a private university it's the alumni. It's to go around the country and talk. It's numerous things that have to do with

keeping the flow into the university of resources. For a public university president, it's regents. It's also trustees for a private university president. It is legislators. It is more and more alumni and it is things that will help the university grow, such as Bob Birgeneau having gone off to Shanghai to open the Center for the College of Engineering, which happened on the same day my course was cancelled by the Chinese.

48-00:13:27

Rubens:

I read his address, which was really wonderful.

48-00:13:30

King:

Yes. So he's out there. It's a very external job. It's not so different from Hillary Clinton [as Secretary of State], what the president is having to do. So the provost has become the person who is responsible for the internal running of a university and it is a very inwardly directed job. It has very little outward component and you have to understand the academy and what faculty need and what drives faculty and what students need and what are the coming trends and your capabilities to do higher education, how it all works best organizationally. The differences among your disciplines and professional areas and what they each need. It's all looking within the university and trying to make it run and work as best it can. So those are two different jobs and therefore some phenomena result from that. One is there have within the last two or three years been two studies polling sitting provosts and one of the questions is do you see within your career plans becoming a president? The majority answer is no. And, again I think it's the difference between the jobs. And it takes one sort of person to do a provost job well and another sort of person to do a president's job well. So given the fact that provosting is very different and an awful lot is written by ex-presidents and hardly anything is written by ex-provosts—I can think of one exception to that, one big exception—that would be a place where a book is needed. But I'd rather do the other one.

48-00:15:36

Rubens:

Would you?

48-00:15:37

King:

The big exception, incidentally, is Jonathan Cole's book of about a year ago called *The Great American Research University* and it's this thick and he was a provost at Columbia.

48-00:15:48

Rubens:

Does your hand gesture here mean big or small?

48-00:15:50

King:

Big. It was this thick. [laughter] It's a lot of pages. Cole had been provost for years at Columbia. And it's not really on provosting but it is an ex-provost book rather than an ex-president book.

48-00:16:30

Rubens:

Regarding AAHHE, is there also a draw for people who want to be provost and remain as provost?

48-00:16:36

King:

Oh, yes. Oh, yes. There is indeed. And there is still some traffic of provosts into presidencies. It's very rare for it to be at the same institution. For the provost of somewhere to become the president of that same somewhere. Now, there are times when that happens and the Penn State episode of the last few weeks is an example where they quite rapidly put the provost into not an acting presidency but the permanent presidency. That's quite striking and unusual. They really had two alternatives. Either to do that sort of thing with a very trusted figure inside the university or to go find a Bob Berdahl.

48-00:17:26

Rubens:

It was something that you had considered, you mentioned earlier.

48-00:17:32

King:

I think who I am and what I am fits much better the provost world than the president world.

48-00:17:37

Rubens:

Well, being at the center seems an ideal perch from which to really—

48-00:17:49

King:

Yes. I think it has worked very, very well that way and it's a good setting for me. It is interesting because in the rare idle moments—I may have mentioned this before. But in the rare idle moments towards the end of my time as provost for the system, I would stare at a piece of paper and jot down some ideas of what I might do after the provost position was over and never once did I put down something like Center for Studies in Higher Education. [laughter] And yet when it came to me, a little bit of thinking said, "This is the right one."

48-00:18:33

Rubens:

You made a great case for that. It just seems to me it had been a wonderful culmination of your career.

48-00:18:42

King:

Yes. One reason I didn't think of it. I think if I have a generalizable shortcoming it's that I don't think ambitiously enough on some things or with enough innovation and creativity and the reason I didn't think of a position like this one is I'm an engineer. Whoever heard of an engineer heading some center like that? That's for social scientists. Or

public policy maybe. But an engineer. [laughter] But I have found in practice that being an engineer gives me a world of possibilities in this work that isn't open to other people.

48-00:19:33

Rubens:

Well, particularly that discussion also specifically about engineering education.

48-00:19:37

King:

Yes.

48-00:19:38

Rubens:

Well creativity doesn't seem to be deficit in your abilities.

48-00:19:50

King:

Well, maybe not. Maybe one always feels that that's something one would like to have more of. Look, it has to do with the number of times in your life that you have seen somebody do something and it was marvelous and very original and innovative and you have the thought, "Why didn't I do that?"

48-00:20:08

Rubens:

Yes, of course. I think people do that at each level. There's no relative—

48-00:20:11

King:

Yes. And the answer is there are a lot of other people and a lot of good minds on other people, so you should expect a lot of good things to come out of other people.

48-00:20:17

Rubens:

So it continues to be very exciting to be here at the university?

48-00:20:23

King:

Very much so and I couldn't ask for more excitement than this present nasty situation on the funding of public universities provides. This really focuses on the sort of thing we can do well here.

48-00:20:38

Rubens:

As a provost and vice president, you didn't have to reckon with student protest—skipping over of course the affirmative action struggle.

48-00:21:03

King:

That world sort of missed me, yes. There were the issues at the Hearst Museum. I'm not dealing with the present protest and I'm an observer and critic of them but—

48-00:21:15

Rubens:

Does this show up in here with research at the center?

48-00:21:20

King:

Nobody has chosen to work on that. We could. I have a visiting scholar right now who's quite interested in it who was here the other day. She's from China. It kind of amazes her that this would go on here.

48-00:21:34

Rubens:

It's an international phenomenon.

48-00:21:38

King:

Yes, it is and particularly striking to the Chinese. You could speculate as to reasons why my course got canceled out. The one that I have the gut feeling is the case is the fact that it was a world of protests at Berkeley and that is not what high Chinese government wants its people to see.

48-00:21:59

Rubens:

So in your beating the bushes and trying to think of how to get more academic buy-in here, it might be that someone will be studying protests.

48-00:22:09

King:

And it could be that the protest area would be a good one, yes.

48-00:22:12

Rubens:

Is there any hope for the school of ed right now to be doing—

48-00:22:29

King:

I think the school of ed is a good school and very leading but by hope I guess you mean to get them back into the world of higher education.

48-00:22:35

Rubens:

Yes, research on higher education.

48-00:22:38

King:

I don't know. They have one person who is in the area right now, Norton Grubb, who deals primarily with community college issues and is a very well-known scholar of those things and holds the David Gardner chair in higher ed. I believe he'll retire soon. And I don't have a good feel for what the plans of the school really may be. I do have some feel because Judith Warren Little and I have talked a couple of times recently. She's the dean. And the more recent of those conversations was two or three weeks ago. So as I read it, I think she is doing some very serious head scratching as to whether to try to get back into higher ed with new hires and I also sense that maybe the faculty as a whole is not very strong on that desire.

**APPENDIX**





## **CURRICULUM VITAE**

C. Judson King is Provost and Senior Vice President - Academic Affairs, Emeritus of the University of California (UC) system, and Professor of Chemical Engineering, Emeritus on the Berkeley campus. He is presently Director of the Center for Studies in Higher Education on the Berkeley campus. Among his administrative responsibilities as Provost and Senior Vice President were the oversight of academic planning and of research and academic policies for the UC system, including academic and programmatic coordination among the ten UC campuses and the three national laboratories managed by the University and frequent dealings with the Regents of the University of California and the state government. He was formerly Provost, Professional Schools and Colleges; Dean of the College of Chemistry; and Chair of the Department of Chemical Engineering, all on the Berkeley campus. He is a member of the National Academy of Engineering, and has received a number of major awards from professional societies. His field of expertise within chemical engineering is separation processes.

### **Positions:**

*University of California:* Provost and Senior Vice President - Academic Affairs, 1996-2004. Interim Provost and Senior Vice President – Academic Affairs, 1995-96. Vice Provost for Research, 1994-96.

*University of California, Berkeley:* Professor of Chemical Engineering, University of California, Berkeley, 1969-2003; Professor Emeritus, 2003-present; Associate Professor, 1966-69; Assistant Professor, 1963-66. Chairman, Dept. of Chemical Engineering, 1972-81; Vice-Chairman, 1967-72. Dean, College of Chemistry, 1981-1987. Provost, Professional Schools and Colleges, 1987-1994. Director, Center for Studies in Higher Education, 2004-present. Interim Director, Phoebe A. Hearst Museum of Anthropology, 2007-2009.

*Massachusetts Institute of Technology:* Assistant Professor of Chemical Engineering, 1959-62. Director, Bayway Station, School of Chemical Engineering Practice, 1959-61.

### **Education:**

Yale University: B.E. in Chemical Engineering, 1956.

Massachusetts Institute of Technology: S.M. in Chemical Engineering, 1958; Sc.D. in Chemical Engineering, 1960.

### **Research:**

Separation Processes: mechanistic phenomena important for dehydration and concentration of foods; use of reversible chemical complexation for recovery of polar organics from dilute aqueous solution by processes such as extraction and adsorption; water and air pollution abatement; energy conservation in separations. Methodology of process synthesis and design.

**Teaching Activities:**

Development of components of the M.S. and Ph.D. graduate programs relating to Chemical Process Design, Development and Synthesis. Graduate and undergraduate courses in Separation Processes, Process Engineering and Synthesis, and Mass Transfer. Freshman seminar, "Chemicals and the Environment". Development of a series of case problems in Chemical Process Design and Engineering. Author of a graduate and undergraduate text, *Separation Processes* (McGraw-Hill, 1971, 1980). Supervisor of 48 completed Ph.D. dissertations and 48 completed M.S. theses.

**Publications:**

Books: *Separation Processes*, McGraw-Hill, 1971; 2nd edition, 1980. *Freeze Drying of Foods*, CRC Press, 1971.

243 chemical engineering publications as journal articles or chapters in books

9 higher education publications as journal articles or chapters in books

14 U. S. Patents

**Honors:**

The Electrochemical Society Lecture, The Electrochemical Society, 1998.  
 Outstanding Alumnus, Yale Science and Engineering Association, Yale University, 1998.  
 Award in Separations Science and Technology, American Chemical Society, 1997.  
 Centennial Medallion, American Society for Engineering Education, 1993.  
 Fellow, American Association for the Advancement of Science, 1993.  
 Clarence G. Gerhold Award, Separations Division of AIChE, 1992.  
 Warren K. Lewis Award, American Institute of Chemical Engineers, 1990.  
 Mac Pruitt Award, Council for Chemical Research, 1990.  
 Award for Excellence in Drying Research, International Drying Symposium, 1990.  
 Ninth Centennial Lecturer in Chemical Engineering, University of Bologna, 1988.  
 Fellow, American Institute of Chemical Engineers, 1983.  
 National Academy of Engineering, 1981.  
 George Westinghouse Award, American Society for Engineering Education, 1978.  
 William H. Walker Award, American Institute of Chemical Engineers, 1976.  
 Food, Pharmaceutical and Bioengineering Division Award, American Institute of Chemical Engineers, 1975.  
 Best Paper Award, 15th National Heat Transfer Conference (with H. L. Fong and H. H. Sephton), 1975.  
 25th Annual Institute Lecturer, American Institute of Chemical Engineers, 1973.  
 Tau Beta Pi  
 Sigma Xi

**Professional Societies:**

*American Institute of Chemical Engineers:* Director, 1987-89. Board of Trustees, AIChE Foundation, 1991-1997. Separations Division: Chair, Founding Committee, 1989-90; Division Chair, 1991, Past Chair, 1992. Chair, Continuing Education Task Force, 1987-88. Meeting Task Force, 1987-88. Chair, Constitution and Bylaws Committee, 1988-89. Meeting Program Chair, San Francisco Annual Meeting,

November, 1979. Member, Education Advisory Board, 1984-1993. Food, Pharmaceutical, and Bioengineering Division: Director, 1975-76; Chair, Award Committee, 1977-1985; 2nd Vice-Chair, 1978; 1st Vice-Chair, 1979; Chair, 1980. Chair, Ad-Hoc Committee on the Expanding Domain of Chemical Engineering, 1973-75; Chair, Chemical Engineering Projects Committee, 1971-73; member, 1964-74. National Program Committee [Area 2d, "Drying", Chair, 1974-79; Member, 1969-82. Area 6b, "Graduate Education", Member, 1972-77.] Member, Dynamic Objectives Committee, 1975-78. Chair of symposia at national meetings. Editor of three volumes of AIChE Symposium Series. Co-instructor of short course on Drying: Principles and Technology, given two to three times per year, 1983-93. Representative to International Scientific Advisory Board for International Congresses on Engineering and Food, 1980-88.

*American Society for Engineering Education*, Search Committee for Editor, Journal of Engineering Education, 2011-12. *Chemical Engineering Division*: Chair, 1978-79. Co-Chair, Organizing Committee 1977 Summer School for Chemical Engineering Faculty. Coordinator of week-long workshop on Chemical Process Design and Engineering, Summer School for Chemical Engineering Faculty, 1972. Publications Board, 1978-85.

*International Committee for Solvent Extraction*, 1983-2000: Technical Program Chairman, International Solvent Extraction Conference (ISEC'83), 1983.

*American Chemical Society*: Industrial and Engineering Chemistry Division: Chairman, Subdivision on Separations Science and Technology, 1986.

*American Association for the Advancement of Science*: Committee on Science, Engineering and Public Policy (1993-1999). Fellow.

#### **Other Professional Activities:**

*California Council on Science and Technology* (California state organization chartered by state government and functioning in ways analogous to the National Research Council): Council member, 1996-2004; Council Chair, 2002-04; Fellow, 2004 – present.

*California Association for Research in Astronomy* (Keck Telescopes, joint between UC and Caltech): Board member, 2000-2006; Board Chair, 2003-2006.

*American University of Armenia Corporation* (Joint activity of UC and the Armenian General Benevolent Union): Board Chair, 1995-2006; 2009-2012.

*National Research Council*: Separations Subcommittee, Committee on Separations Technology and Transmutation Systems (Nuclear Wastes), 1991-93. Chair, Committee on Separation Science and Technology, Board on Chemical Science and Technology, 1983-1987. Board of Assessments for National Bureau of Standards Programs: Review Panel for Center for Chemical Engineering, 1982-86; Chair, 1984-86. Review Panel for National Engineering Laboratory, 1985-89; Chair, 1987-89. Committee on Science, Engineering and Public Policy,

Committee for Evaluation of EPSCoR and similar Federal Agency Programs, 2012-13.

*National Academy of Engineering*: Chair, Section 3, Chemical Engineering (2008-09); Vice Chair (2007-08). Chair, Committee on Metrics of Instructional Scholarship, 2007-08. Chair, Advisory Committee to Center for Advancement of Scholarship on Engineering Education (CASEE), 2005-present; member 2003-present. Chair, Committee on Alternatives to Chlorofluorocarbons as Solvents (1991-92). Peer Committee for Chemical Engineering (1987-88); Chair, 1988). Peer Committee for General Engineering (1986). Peer Committee for Biotechnology (1985).

*National Science Foundation*: Chair, Panel on Separations Technologies, Japan Technology Evaluation Program, 1992-93. Advisory Committee for Engineering Directorate, 1983-86. Subcommittee for Chemical and Process Engineering Division, 1981-85; Chair, 1983-85.

*Council for Chemical Research*: Chair, 1989. Member, University-Industry Task Force on Cooperative Advances in Chemical Science and Technology (Founding Committee), 1980-81. Founding Board Member, 1980-82; Board Member, 1987-89. Executive Committee, 1987-90; Chair, Manpower and Resources Committee, 1981-83; Chair, Science Advisory Board, 1984-87; Program Committee and Co-Organizer of Annual Meeting held in Berkeley, September 1984. Chair-elect, 1988; Chair, Program Committee, 1988.

*Governor's Task Force on Toxics, Waste and Technology* (State of California), 1984-85: Chair, Technical Advisory Committee on Technological Considerations, 1986.

*Lawrence Berkeley National Laboratory*: Chemical Engineering (Separations) Program, Nuclear Chemistry Division, 1963-75; Chemical Processes Program, Energy & Environment (Applied Science) Division, 1976-present; Program Leader, 1978-81; Faculty Senior Scientist, 1987-present.

*Engineering Foundation Conference on Separation Technology*: Co-Chair, 1989.

*Gordon Conference on Separation and Purification*: Vice-Chair, 1985; Chair, 1986.

*University of California*: President's Council on the National Laboratories (oversight of Lawrence Berkeley, Lawrence Livermore and Los Alamos National Laboratories), 1992-94. Science and Educational Advisory Committee (oversight of Lawrence Berkeley Laboratory), 1987-92. Numerous committees and task forces in capacity as Provost and Senior Vice President - Academic Affairs. University of California Press, Board Chair, 1995-2004.

*University of California, Berkeley*: Chair, Review of Information Technology at Berkeley: Governance, Funding and Structure, 2005-06. Chair, Information Planning Group, 1994-94 (defined new program and School of Information Systems and Management). Chair of Building and Project Steering Committees: Chemical Engineering Building (1987-1994); Nuclear Reactor Decommissioning (1987-1991); Computer Science Building, Soda Hall (1987-1994); Haas School of

Business Building (1987-1994); Hearst Memorial Mining Building (1990-1994); Minor Hall Expansion (1990-1993); Projects Coordinating Committee (1990-1994); Boalt Hall (Law) Expansion (1992-1994); Northwest Precinct Study (1993-94); Lawrence Hall of Science Expansion (1991-94); College of Chemistry Space Studies (1985-86; 1993-94); College of Natural Resources Space Study (1993-94). Numerous other committees and task forces in capacity as Provost, Professional Schools and Colleges.

*Yale University:* University Council, 1988-93; Chair, Committee on Physical Sciences and Engineering, 1988-93. Advisory Board to School of Engineering, 2012 – present.  
*Advisory Committees to Departments of Chemical Engineering:* University of Wisconsin, 1987-1992; Louisiana State University, 1981-1985 (Chair, 1983-85); University of New Mexico, 1978-81.

Other Advisory Committees: Dow Chemical Company, Academic Advisory Council, 1987-1989; Michigan Biotechnology Institute, Research Advisory Committee, 1987-1992. Massachusetts Institute of Technology, Visiting Committee, Department of Chemical Engineering, 1975-78.

*Editorial Advisory Boards:* Industrial & Engineering Chemistry Research, 1986-1990. Journal of Separation Process Technology, 1979-1982; Chemical Engineering and Processing, 1982-1994; Solvent Extraction and Ion Exchange, 1985-2002; Drying Technology, 1983-1999; Journal of Food Process Engineering, 1976-1987; I&EC Process Design and Development, 1975-79; Journal of Food Science, 1979-82.

*External Reviewer:* Department of Chemical Engineering, University of Utah, 1979; Department of Chemical Engineering, University of Colorado, 1983; Department of Chemical Engineering, Purdue University, 1979; Chemical Technology Division, Oak Ridge National Laboratory, 1984.

*Board of Judges:* Kuwait Foundation for Advancement in Science Awards in Petro/Chemical Engineering, Kuwait, 1983. Kirkpatrick Award for Chemical Engineering Achievement, 1977, 1979, 1981, 1983 (Chair); Individual Achievement Award, Chemical Engineering (periodical), 1976-1984.

*Visiting Appointment:* W. W. Clyde Visiting Professor of Engineering, University of Utah, January - June, 1978.

*Search Committees:* Director, Phoebe A. Hearst Museum of Anthropology (2008-09), Director, Lawrence Berkeley Laboratory, 1989; Head, Energy & Environment Division, Lawrence Berkeley Laboratory (1977-78); Director, Sea Water Conversion Laboratory, University of California, Berkeley (1979-80), Chair.

**Consulting:**

King Abdullah University of Science and Technology, Thuwal, Saudi Arabia, 2010-2011.

The Procter and Gamble Company, Cincinnati, Ohio: Coffee Division, 1969-1988;  
Industrial Chemicals Division, 1965-66, 1979-80.

CPC International, Inc. (Corn Products), Summit-Argo, Illinois, 1982-1987.

American Cyanamid Co., Bound Brook, New Jersey, and Stamford, Connecticut 1982-83.

Cutter Laboratories, Inc., Berkeley, California, 1978-82.

Merix Corp., Wellesley, Massachusetts, 1976-81.

Pullman Kellogg Co., Houston, Texas, 1976-77.

Air Products and Chemicals, Inc., Allentown, Pennsylvania, 1976-77.

Lockheed Missiles and Space Corp., Sunnyvale, California, 1970-76.

Marine Colloids Corp., Rockland, Maine, 1973-76.

Kennecott Copper Corp., Ledgemont Laboratory, Lexington, Massachusetts, 1974-76.

SNAM Progetti, S.p.A., Milan, Italy, 1971-74.

ALZA Corp., Palo Alto, California, 1971-73.

Amicon Corp., Lexington, Massachusetts, 1967-71.

Numerous one and two-day consulting relationships.

**Community Activities:**

Snowcreek III Owners Association, Mammoth Lakes CA, Chair, 2007-2011; member, 1998-2012.

Scoutmaster, Boy Scout Troop 100, Kensington, California, 1975-86.

President, Kensington Community Council, 1972-73; Director, 1970-73.

President, Kensington Dad's Club, 1970-71; Various offices, 1966-73.

**Vital Statistics:**

Born: September 27, 1934, Ft. Monmouth, New Jersey, U.S.A.

Married, three children

## **PUBLICATIONS**

1. "Systems Analysis in Chemical Process Design: An Example." Trans. Rutgers Conf., Amer. Soc. Qual. Control, 13, 129 (September, 1961).
2. "Absorption and Distillation" (with J. E. Vivian) in Modern Chemical Engineering, A. Acrivos, ed., Chap. 9, Vol. I, p. 437-485, Reinhold Publ. Co. (1963).
3. Book Review: "Saline Water Conversion " II. R. F. Gould, ed., Amer. Chem. Soc., Science, 141, 626 (August 16, 1963).
4. Book Review: "Mass Transfer Process Calculations", by H. Sawistowski and W. Smith. Chem. Eng. News, 41, 68 (1963).
5. "Fresh Water from Sea Water" in A Course in Process Design by T. K. Sherwood, M. I. T. Press (1964).
6. "Diffusivities of Slightly Soluble Gases in Water" (with J. E. Vivian). A.I.Ch.E. Jour., 10, 220 (1964).
7. "The Mechanism of Liquid Phase Resistance to Gas Absorption in a Packed Column" (with J. E. Vivian). Pres. at A.I.Ch.E. Mtg., Buffalo, May, 1963. A.I.Ch.E. Jour., 10, 221 (1964).
8. "The Additivity of Individual Phase Resistances in Mass Transfer Operations" Pres. at A.I.Ch.E. Mtg., Pittsburgh, May, 1964. A.I.Ch.E. Jour., 10, 671 (1964).
9. Letter to the Editor: "For Curved Operating Line" Chem. Eng., 72, 7 (March 15, 1965).
10. "Mass Transfer During Short Surface Exposures in Countercurrent Flow" Ind. Eng. Chem. Funds., 4, 125 (1965).
11. "Gas-Liquid Mass Transfer in Cocurrent Froth Flow" (with J. M. Heuss and C. R. Wilke). UCRL-11570 Rev., A.I.Ch.E. Jour., 11, 866 (1965).
12. "Liquid Phase Diffusion of Nonelectrolytes at High Dilution" (with L. Hseuh and K-W. Mao). J. Chem. Eng. Data, 10, 348 (1965).
13. "Turbulent Liquid Phase Mass Transfer at a Free Gas-Liquid Interface" I&EC Funds., 5, 1 (1966).
14. "The Influence of Diffusivity on Liquid Phase Mass Transfer to the Free Interface in a Stirred Vessel" (with A. A. Kozinski). Pres. at A.I.Ch.E. Mtg., Philadelphia, December 1965. A.I.Ch.E. Jour., 12, 109 (1966).

15. "Concentration-Dependent Diffusion Coefficients and Rates of Mass Transport" I&EC Funds., 5, 146 (1966).
16. Letter to the Editor: "On the Addition of Phase Resistances" Chem. Eng. Sci., 21, 196 (1966).
17. "Pyrolysis of Ethylbenzene With and Without Oxygen Initiation" (with E. D. Hausmann). UCRL-16021 Rev., I&EC Funds., 5, 295 (1966).
18. "Axial Dispersion in Liquid Flow through Packed Beds" (with S. F. Miller). UCRL-11951 Rev., A.I.Ch.E. Jour., 12, 767 (1966).
19. "Liquid Diffusivities in the Glycol-Water System" (with C. H. Byers). UCRL-16622, J. Phys. Chem., 70, 2499 (1966).
20. "Factors Influencing the Rate of Heat Conduction in Freeze-Drying" (with T. A. Triebes). I&EC Proc. Des. Devel., 5, 430 (1966).
21. Book Review: "Mass Transfer and Absorbers", by T. Hobler, A.I.Ch.E. Jour., 12, 626 (1966).
22. "The Relationship Between Transport Properties and Rates of Freeze Drying of Poultry Meat" (with O. C. Sandall and C. R. Wilke). Pres. at A.I.Ch.E. Mtg., Detroit, December 1966. A.I.Ch.E. Jour., 13, 428 (1967); Chem. Eng. Prog. Symp. Ser., 64, No. 86, 43 (1968).
23. "Gas-Liquid Mass Transfer with a Tangentially Moving Interface: Part I. Theory" (with C. H. Byers). A.I.Ch.E. Jour., 13, 628 (1967).
24. "Gas-Liquid Mass Transfer with a Tangentially Moving Interface: Part II. Experimental Studies" (with C. H. Byers). Pres. at A.I.Ch.E. Mtg., Detroit, December, 1966. A.I.Ch.E. Jour., 13, 637 (1967).
25. "Chemical Engineering Case Problems" (with Dr. R. Woods, P. L. Silveston and J. H. Gary). Education Projects Committee, A.I.Ch.E., New York (1967). Chap. 1, The Use of Case Problems in Chemical Engineering Instruction; Chap. 2, Continuous Drying of Air; Chap. 5, Production of Benzene and Xylenes by Hydrodealkylation. Also presented at A.I.Ch.E. Mtg., New York, November 1967.
26. "Rates of Moisture Sorption and Desorption in Porous Dried Foodstuffs" Food Technol., 22, 509 (1968).
27. "Convective Heat Transfer for Freeze Drying of Foods" (with J. P. Clark). Pres. at Inst. of Food Technol. Annual Mtg., Philadelphia, May 22, 1968. Food Technol., 22, 1235 (1968).



28. "Physical Properties Important for the Freeze-Drying of Poultry Meat" (with W. K. Lam and O. C. Sandall). *Food Technol.*, 22, 1302 (1968)
29. "Mass Transport in Freeze-Drying: Basic Studies and Processing Implications" (with R. D. Gunn and J. P. Clark). International Institute of Refrigeration, Commission X, Lausanne, Switzerland, Annexe 1969-4, pp. 79-94, June, 1969.
30. "Mass Transport in Porous Materials under Combined Gradients of Composition and Pressure" (with R. D. Gunn). Pres. at A.I.Ch.E. Mtg., New York, November, 1967. *A.I.Ch.E. Jour.*, 15, 507 (1969).
31. "Evaporation Rates of Volatile Liquids in a Laminar Flow System: I. Pure Liquids, II. Liquid Mixtures" (with M. W. Clark). Pres. at A.I.Ch.E. Mtg., Tampa, Florida, May, 1968. UCRL-19655, 19656. *A.I.Ch.E. Jour.*, 16, 64, 69 (1970).
32. "Case Problems in Chemical Process Design and Engineering" *Chem. Eng. Education*, 4, 124 (1970).
33. "Freeze Drying of Foodstuffs. CRC Critical Reviews in Food Technology" 1, 379 (1970); reissued as *Freeze Drying of Foods*, with new Appendix (hardcover), Chemical Rubber Publ. Co., Cleveland, Ohio (1971).
34. Book Review: "Describing Chemical Engineering Systems", by W. E. Ranz. *A.I.Ch.E. Jour.*, 16, 1117 (1970).
35. "Process Design with Computers" (Diseno de Procesos con Computadoras) (with F. J. Barnés). Tercer Seminario Latino Americano de Quimica, Cd. de Mexico, 1970.
36. Book: "Separation Processes", McGraw-Hill (1971).
37. "Mass Transport Characteristics of Freeze-Dried Foods" (with R. D. Gunn). Pres. at A.I.Ch.E. Mtg., Los Angeles, December, 1968; *Chem. Eng. Prog. Symposium Series*, 67, No. 108, 94 (1971).
38. "Convective Freeze-Drying in Mixed or Layered Beds" (with J. P. Clark). Pres. at A.I.Ch.E. Mtg., Los Angeles, December, 1968; *Chem. Eng. Prog. Symposium Series*, 67, No. 108, 102 (1971).
39. "Factors Governing Terminal Rates of Freeze-Drying of Poultry Meat" (with A. Margaritis). Pres. at A.I.Ch.E. Meeting, Portland, Oregon, August, 1969; *Chem. Eng. Prog. Symposium Series*, 67, No. 108, 112 (1971).
40. "Retention of Volatile Flavor Components during Drying of Fruit Juices" (with S. K. Chandrasekaran). Pres. at A.I.Ch.E. Mtg., Washington, D.C., November,

- 1969; Chem. Eng. Prog. Symposium Series, 67, No. 108, 122 (1971).
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8. Engineers Deserve a Liberal Education, Guest Editorial, *Chem Engg Educ*, Winter 2008; also in *Engineering Impact*, Purdue University, Winter 2007-08, p. 19.
9. Innovation in California: A University Viewpoint, Salzburg Seminar #451, Innovation in Knowledge-Based Economies: Accelerating the Benefits, April 13-18, 2008.
10. Developing Metrics for Assessing Engineering Instruction: What Gets Measured is What Gets Improved, with S. A. Ambrose, R. A. Arreola & K. Watson, National Academies Press, Washington DC, 2009.  
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12. *Globalization's Muse: University and Higher Education Systems in a Changing World*, J. A. Douglass, C. J. King & I. Feller, eds., Berkeley Public Policy Press, Institute of Governmental Studies, University of California, Berkeley, 2009. (edited volume)
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**GRADUATE PhD DISSERTATION, MS THESIS STUDENTS,  
POSTDOCTORAL SCHOLARS, AND VISITING SCHOLARS  
UNDER THE SUPERVISION OF C. JUDSON KING**

1. Jon M. Heuss, MS, 1964. Mass Transfer in Cocurrent Gas-Liquid Flow (Senior Scientist, General Motors Research Laboratory, Warren MI), with C. R. Wilke.
2. Allen A. Kozinski, MS, 1964. The Influence of Diffusivity on Gas Absorption in an Agitated Vessel (Group Vice President of Refining, Amoco Corporation, ret.)
3. Edwin D. Hausmann, MS, 1965. Pyrolysis of Ethylbenzene with and without Oxygen Initiation (Principal, Co-Founder and General Counsel of First Financial Capital, Los Angeles CA).
4. Steven F. Miller, MS, 1965. Axial Dispersion in Liquid Flow through Packed Beds (Engineer, Criterion Catalysts, Pittsburg CA).
5. Thomas A. Triebes, MS, 1966. Thermal Conductivity of Porous Media as Related to Freeze-Drying (Dow Chemical Co., retired)
6. Charles H. Byers, PhD, 1966. Convective Transfer Processes in Laminar Gas-Channel Flow (Founder and President, IsoPro International, Menlo Park CA).
7. Orville C. Sandall, PhD, 1967. Interactions between Heat and Mass Transfer in Freeze Drying (Professor of Chemical Engineering Emeritus, University of California at Santa Barbara).
8. Georges S. Beauduin, MS, 1967. Simulation and Optimization of a Hydrodealkylation Plant (Oil Refining and Energy Consultant, Marseille, France), with A. S. Foss.
9. Robert D. Gunn, PhD, 1967. Mass Transfer in Porous Media as Applied to Freeze-Drying (Professor of Chemical Engineering, University of Wyoming, deceased).
10. Wing K. Lam, MS, 1967. Sorption and Pore Characteristics of Freeze-Dried Turkey
11. Michael W. Clark, PhD, 1967. Mass Transfer Processes in Laminar Two-Phase Flow (Dow Chemical Co., ret., Reno NV).
12. John Z. Grens, MS candidate 1966-67. Improvements to the Design of Demethanizer Columns, deceased.
13. Marvin Hyman, MS, 1967. Computational Study of a Refinery Hydrogen Plant (Bechtel Environmental, Inc., Richland WA), with A. S. Foss.

14. Rajagolapan Ramji, MS, 1967. Selection of Approaches for Computer Simulation of Recycle Chemical Processes (President, Asia Pacific Technologies Corp. Pleasant Hill CA), with A. S. Foss.
15. J. Peter Clark, PhD, 1968. Synthesis and Evaluation of an Improved Freeze-Drying Process (Consultant & former President, Epstein Food Engineering Co.)
16. Romesh Kumar, MS, 1968. Development of a Continuous Condenser for the Freeze-Drying Process. PhD, 1972, Continuous Desublimation of Water Vapor on Falling Brine Film (Group Leader, Argonne National Laboratory, Argonne IL).
17. Argyrios Margaritis, MS, 1968. Factors Affecting Terminal Rates of Freeze-Drying (Professor of Chemical Engineering, University of Western Ontario, London ,Ontario, Canada).
18. Carlo Alesandrini, MS, 1969. Simulation of a Hydrodealkylation Plant: Efficiency of Computation (Stauffer Chemical Co. % successor companies; Lecturer in Chemical Engineering, University of California, Berkeley), with A. S. Foss.
19. Edward J. Palkot, MS, 1968. The Design of an Improved Device for Absorption with Chemical Reaction (ExxonMobil Corp., Houston TX).
20. David L. Heaven, MS, 1969. Optimal Sequencing of Distillation Columns (Director, Process Engineering, Fluor-Daniel Corp., Irvine CA), with E. A. Grens).
21. William H. Brown, MS, 1969. Interfacial Mixing Cells and Mass Transfer in Turbulent Flow (Senior Engineer, Georgia Pacific Corp., Camas WA ret.)
22. Francisco J. Barnés, MS, 1970. Evaluation of Alternative Designs of a Demethanizer Column. PhD, 1973 Systematic Synthesis of Mechanical Refrigeration Systems (former Rector, National Autonomous University of Mexico, Mexico City, Mexico).
23. David W. Gantz, MS Candidate 1969-70. Logical approaches to the Synthesis of Chemical Processes
24. S. Kumar Chandrasekaren, PhD, 1971. Volatiles Retention during Drying of Food Liquids (former President, InSite Vision, Alameda CA).
25. Richard J. Bellows, PhD, 1972. Freeze-Drying of Food Liquids: Dependence of Collapse Temperature upon Composition and Concentration (President, Bellows Advanced Energy, Woodland CA).
26. Prabir K. Basu, PhD, 1972. Development of a Process for the Manufacture of Silicon Tetrachloride from Rice Hulls (Senior Director, G. D. Searle & Co., Skokie IL), with S. Lynn.



27. Abdel Monem Omran, PhD, 1972. Kinetic and Process Considerations for Freeze Concentration of Food Liquids (Chief Investment Officer, Belltone Private Equity, Cairo, Egypt).
28. Ian F. Davenport, PhD, 1972. The Initiation of Natural Convection Caused by Time-Dependent Profiles.
29. Roger W. Thompson, PhD, 1972. Synthesis of Separation Schemes.
30. Richard K. Herz, MS, 1972. Characterization of Organic Pollutants in Industrial Waste Waters by Gas Chromatographic Methods (Associate Professor, Jacons School of Engineering, University of California, San Diego).
31. Hugo A. Massaldi, Postdoctoral, 1972-73. Retention of Immiscible Aroma Components during Drying of Food Liquids (Professor, Institute of Hygiene, University of the Republic of Uruguay).
32. Clifford M. Lowe, MS, 1973. Slush Evaporation: Dehydration from a Partially Frozen State (Engineer, Chevron Corporation, Richmond CA).
33. Timothy T. Revak, MS, 1973. Natural Surface Active Agents in Sea Water (Collagen Corporation, Palo Alto CA), with H. H. Sephton.
34. Ronald M. Carn, MS, 1974. Limited Freeze Drying (Orthopaedic Surgeon, Redding CA).
35. James H. Stocking, PhD, 1974. Kinetics of Ice Nucleation in Sugar Solution and Fruit Juices.
36. Jonathan P. Earhart, PhD, 1975. Recovery of Organic Pollutants from Industrial waste Water by Solvent Extraction (Castro Valley CA).
37. Howard L. Fong, PhD, 1975. Heat Transfer and Flow Characteristics in an Upflow Vertical Tube Evaporator with the Addition of a Surfactant (Shell Development Company, Houston TX), with H. H. Sephton.
38. Russell L. Jopnes, PhD, 1975. Process Development of Limited Freeze-Drying (Bayer Crop Science, Stillwell KS).
39. Russell R. Peterson, MS, 1975. The Application of Separation Processes to the Pretreatment of Reverse Osmosis Feed Water, with H. H. Sephton.
40. Ernesto Valdes-Krieg, PhD, 1975. Foam and Bubble Fractionation (Owner, Cezap, Mecico City, Mexico), with H. H. Sephton.

41. Ho-Yan Wong, MS, 1976. Solvent Extraction of Organic Pollutants from Industrial Wastewater.
42. John A. Zarkarian, MS, 1976. Limited Freeze-Drying of Beef. PhD, 1979. Volatiles Loss in the Nozzle Zone during Spray Drying of Emulsions (Senior Staff Engineer, Chevron Corporation, Richmond CA).
43. James M. Wardell, MS, 1976. Gas-Chromatographic Analyses of Acetic Acid Production Wastewaters and Selection of Solvents for the Extraction of Carboxylic Acids (Senior Process Engineer, Chevron Corporation, Richmond CA).
44. Gary T. Rochelle, PhD, 1977. Process Synthesis and Innovation in Flue Gas Desulfurization (Professor of Chemical Engineering, University of Texas at Austin, Austin TX).
45. Ogbemi O. Omatete, Postdoctoral, 1976-77. Loss of Volatile Constituents upon Rehumidification of Freeze-Dried Substances (Oak Ridge National Laboratory, Oak Ridge TN, ret.).
46. Thomas H. Quick, MS, 1977. Oxygen Absorption in a Mineral Flotation Device (Smurfit Stone Container, Carol Stream IL), with H. H. Sephton.
47. Gilbert W. Sanchez, MS, 1977. Recovery of Organic Pollutants from Industrial Wastewaters by Solvent Extraction (Miller Brewing Company, Milwaukee WI).
48. James N. Michaels, MS, 1977. Selection of Solvents for Extraction of Wacker Process Wastewaters (Senior Scientific Director, Merck & Co., Inc., Whitehouse Station NJ).
49. Theo G. Kieckbusch, PhD, 1978. Volatiles Losses in the Nozzle Zone of Spray Drying of Liquid Foods. Visiting Scholar, 1980. Concentration and Drying of Liquid Foods (Professor of Food Engineering, State University of Campinas, Brazil).
50. Carl P. Beitelshees, PhD, 1978. Precipitate Flotation of Copper Sulfide (E. I. DuPont de Nemours, Lockport NY).
51. N. Lawrence Ricker, PhD, 1978. Solvent Extraction of Wastewaters from Acetic-Acid Manufacture (Professor of Chemical Engineering, University of Washington, Seattle WA).
52. Edward F. Pittman, MS, 1979. Use of Amine Solvents for Extraction of Organic Acids from Wastewaters (Dow Chemical Co., Paquemine LA).
53. Fumitake Nakashio, Visiting Professor, 1978-79. Computational Procedures for Solvent Extraction with Backmixing (Professor of Applied Chemistry, Kyushu University, Japan).

54. Douglas C. Greminger, MS, 1979. Extaction of Phenols from Coal Conversion Process Condensate Waters (Research Leader, Dow Chemical Co., Midland MI).
55. Jose Flores-Luna, MS, 1979. Viscous Behavior in Superconcentrated Sugar Solutions 9Technical Manager, Novum Pharmaceutical Division, Mexico City, Mexico).
56. M. Benes, Visiting Scholar, 1979. Processing of Condensate Waters from Solid-Fuel Conversion.
57. Ricardo Vega, MS, 1980. Concentration of Liquid Foods by Perstraction (Vice Dean for Teaching, University of Santiago, Santiago, Chile).
58. C. Gail Greenwald, PhD, 1980. Particle Morphology in the Spray Drying of Foods (Executive and Angel Investor; former Vice President, Arthur D. Little Co.)
59. Nancy E. Bell, MS, 1980. Solvent Extraction of Phenolics from Water.
60. Joel D. Hill, MS, 1980. Stripping of Process Condensates from Solid Fuel Conversion (It McGill, Tulsa OK).
61. Maw-Ling Wang, Visiting Professor, 1979-80. Energy Conservation in Absorption Process (Professor, National Chung Cheng University, Taiwan).
62. Galen E. Downton, MS, 1981. The Mechanism of Stickiness in Amorphous Powders (Proctor & Gamble Co., Cincinnati OH).
63. Timothy A. Barbari, MS, 1981. Extraction of Chlorinated Hydrocarbons and Aromatics from Wastewater (Associate Provost for Graduate Affairs, Boston University, Boston MA).
64. John L. Bomben, PhD, 1981. The Morphology of Ice Formation in Frozen Foods (SRI International, Menlo Park CA).
65. John D. MacGlashan, MS, 1982. Extraction of Phenols from Water with Trioctyl Phosphine Oxide (Shell Western Exploration and Production Co., Houston TX).
66. John J. Senetar, MS, 1982. Extraction of Polar Organics from Water: A Case Study for Several Pollutants. PhD, 1986. Treatment of Coal-Gasification Condensate Waters (Bechtel Group, Inc., San Francisco CA).
67. Mark E. Etzel, PhD, 1983. Loss of Volatile Trace Organics during Spray Drying (Professor of Food Science and Chemical Engineering, University of Wisconsin, Madison WI).

68. Dilip K. Joshi, PhD, 1983. Extraction of Polar Organic Chemicals from Water (Senior Research Scientist, Pharmacia & Upjohn, Inc., Kalamazoo MI).
69. Mathew Frierman, MS, 1983. The Use of Solid Adsorbents for the Recovery of Acetic Acid from Aqueous Solution (Vice President, Sales, Netprospex, Pall Life Sciences, San Francisco CA).
70. Keith Alexander, PhD, 1983. Factors Governing Surface Morphology in the Spray-Drying of Foods (Adjunct Professor of Chemical Engineering & Assistant Dean, College of Chemistry, University of California, Berkeley; former Sr. Vice President, Planning, CH2M Hill).
71. Donald H. Mohr, PhD, 1983. Identification and Separation of the Organic Compounds in Coal-Gasification Condensate Waters (Chevron Corporation, Richmond CA).
72. James L. Bixby, MS, 1983. The Regeneration of Trioctyl Phosphine Oxide Solutions Used to Extract Phenol from Water.
73. Patricia D. Mackenzie, PhD, 1984. Simultaneous Stripping and Solvent Extraction for the Recovery of Ammonia and Acid Gases from Wastewaters (Staff Engineer, General Electric Foundation, Schenectady NY).
74. Douglas D. Frey, PhD, 1984. Experimental and Theoretical Investigation of Foam Spray Drying (Professor of Chemical Engineering, University of Maryland, Baltimore County, Baltimore MD).
75. Yue Kuo, Postdoctoral, 1982-84. Chemical Modification of Adsorbents to Enhance Properties for Recovery of Polar Organics from Water (Dow Professor of Chemical Engineering, Texas A&M University, College Station TX).
76. Paul A. Sanchez, MS, 1985. Distillative Regeneration of Carbon Adsorbents (Market Development Manager, BP Amoco Foundation, Naperville IL).
77. Curtis L. Munson, PhD, 1985. Separation of Polar Organics from Aqueous Solutions by the Methods of Liquid Extraction and Adsorption onto Activated Carbon (Manager of Process Technology R&D, Chevron Corporation, Richmond CA).
78. M. Lao, Postdoctoral, 1984-85. Regeneration of Adsorbents by Solvent Leaching.
79. A Steven Kertes, Visiting Professor, 1984-85 and 1987. Extraction of Alcohols and Carboxylic Acids (Professor of Chemistry, Hebrew University, Jerusalem, Israel, deceased).
80. Rodney E. Thompson, PhD, 1986. Energy Conservation in Regenerated Chemical Absorption Processes (President, BioPharm Process Associates, Piedmont CA).

81. Y. Kawano, Visiting Scholar, 1985-86. Distillative Regeneration and Esterification of Adsorbed Carboxylic Acids.
82. Tarric M. El-Sayed, PhD, 1987. Factors Governing Morphology of Spray-Dried Particle (Vice President, Research and Development, Clorox Corporation, Oakland CA).
83. Spyridon E. Papadakis, PhD, 1987 Interpretation of Temperature and Humidity Fields near the Atomizer in Spray Drying (Professor of Food Engineering, TEI of Athens, Athens, Greece).
84. William G. Rixey, PhD, 1987. Non-wet Adsorbents for the Selective Recovery of Polar Organic Solutes from Dilute Aqueous Solution (Professor of Civil Engineering, University of Houston, Houston TX).
85. Antonio A. Garcia, PhD, 1988. The Modification and Use of Adsorbents for the Recovery of Acetic Acid from Dilute Aqueous Solutions (Professor of Biological and Health Systems Engineering, Arizona State University, Tempe AZ).
86. Mindy Ng, MS, 1988. Regeneration of Basic Polymeric Sorbents Containing Acetic Acid (Air Products & Chemicals, Inc., Allentown PA).
87. Janet A. Tamada, PhD, 1988. Extraction of Carboxylic Acids from Aqueous Solution by Means of Amine Extractants (J Tamada Consulting, Mountain View CA).
88. Terry M. Grant, PhD, 1988. Irreversibilities in Adsorption of Phenols onto Carbon (Director, Strategic Alliances Pulp Division, Weyerhaeuser Corporation, Tacoma WA).
89. David A. Wallack, Ph. D., 1988. Particle Properties in Spray Drying (3M Corporation, St. Paul MN).
90. Daniel R. Arenson, PhD, 1988. Extraction of Alcohols from Aqueous Solution by Means of Phenolic Extractants (Pfizer, Inc., Groton CT).
91. Robert J. Fields, MS, 1988. Transport of Water in Cellulose (ExxonMobil, Baton Rouge LA).
92. Loree J. Poole (Fields), PhD, 1989. Recovery of Ammonia from Sour Waters and Amine Regeneration Processes (Woodward-Clyde Consultants, Baton Rouge LA).
93. Baishen Liang, Postdoctoral, 1987-89. Drying Phenomena.
94. John N. Starr, PhD, 1991. Regeneration of Amine Extractants (Process Technology Leader, NatureWorks LLC, Minneapolis MN).

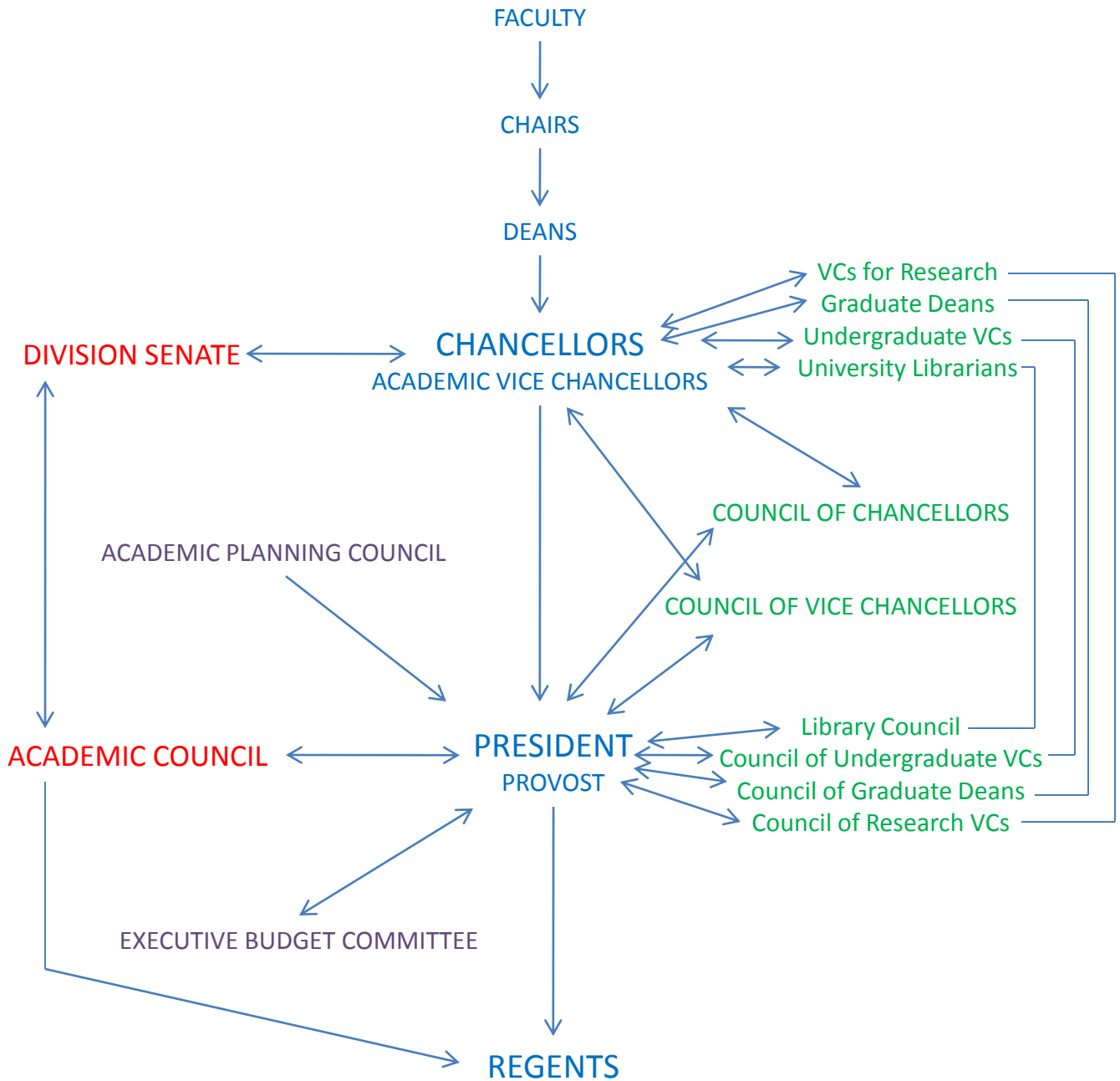
95. Paul A. Verderber, MS, 1991. Loss of Trace Volatile Components during Drying of Pendant Drops (Laboratory Manager, Higher Dimension Research, Woodbury MN).
96. Lucy A. Randel, MS, 1991. Separation of Glycols from Dilute Aqueous Solution via Complexation with Boronic Acids (M. W. Kellogg Co., Houston TX).
97. Jorge M. Sunkel, MS, 1992. Loss of Volatile Components and Morphological Events during Drying of Single Pendant Drops (Procter & Gamble Co., Cincinnati OH).
98. Tina K-F. Chow, MS, 1992. Separation of Compounds with Multiple –OH Groups from Dilute Aqueous Solutions via Complexation with Organoboronate.
99. Lisa A. Tung, PhD, 1993. Recovery of Carboxylic Acids at pH Greater than pKa (Rohm & Haas Co., Spring House PA).
100. Vincent Van Brunt, Visiting Professor, 1993-94. Water-enhanced Solvation. (Distinguished Professor of Chemical Engineering, Emeritus, University of South Carolina, Columbia SC).
101. Hubert Reisinger, Postdoctoral, 1993-94. Extraction of Acetic Acid to Form Calcium Magnesium Acetate (Verbundplan, Klagenfurt, Austria).
102. Jane H-J. Lee (MacDonald), MS, 1993. (Section Manager, Altria Group, New York NY)
103. Robert R. Broekhuis, MS, 1993. Recovery of Propylene Glycol from Dilute Aqueous Solutions by Reversible Reaction with Aldehydes (Air Products & Chemicals, Allentown PA), with S. Lynn.
104. Youyuan Dai, Postdoctoral, 1994-95. Selectivity between Lactic Acid and Glucose during Recovery of Lactic Acid with Basic Extractants and Polymeric Sorbents (Professor of Chemical Engineering, Tsinghua University, China).
105. S. Scott Moor, PhD, 1995. Visualization of Spray Dynamics in a Pilot Spray Dryer by Laser-initiated Fluorescence (Associate Professor of Engineering, Indiana University-Purdue University, Fort Wayne IN).
106. James Kilduff, Postdoctoral, 1995-96. Effect of Carbon Surface Properties on the Uptake and Regeneration of Phenol (Associate Professor of Civil and Environmental Engineering, Rensselaer Polytechnic Institute, Troy NY).
107. Scott M. Husson, PhD, 1998. Regeneration of Basic Adsorbents in the Recovery of Carboxylic Acids from Dilute Aqueous Solution and Multiple-Acid Equilibria in Adsorption of Carboxylic Acids from Dilute Aqueous Solution (Professor of Chemical Engineering, Clemson University, Clemson SC)

108. Daniel Chinn, PhD, 1999. Recovery of Glycols, Sugars and Related Poly-OH Compounds from Dilute Aqueous Solution by Regenerable Adsorption onto Activated Carbons (Chevron Corporation, Richmond CA).
109. John P. Hecht, PhD, 1999. Influence of the Development of Drop Morphology on Drying Rates and Loss Rates of Volatile Components during Drying (Technology Leader, Procter & Gamble Corp., Cincinnati OH).
110. Simona Dingfelder, Visiting Scholar, 2011. Higher Education Structure and Governance (Ministry of Education, State of Baden-Württemberg, Germany).
111. Ye Meilan, Visiting Scholar, 2012. Higher Education Structure and Governance (Vice President, Nanjing University of Posts and Telecommunications, China).
112. Zhao Maocheng, Visiting Scholar, 2011. Higher Education Structure and Governance (Vice President, Nanjing Forestry University, China).





# UNIVERSITY OF CALIFORNIA ACADEMIC GOVERNANCE



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Line Administration

Academic Senate

Combined Administration and Senate

System-wide Groups (informal roles)

1996 internal document,  
King personal papers