AN INTERVIEW WITH

ROBERT E. BUCKMAN

By

Harold K. Steen

July 1992
Corvallis, Oregon

Foreword

I am pleased to join several of my predecessors in reflecting on events and people that shaped research in the Forest Service, and how that research was intertwined with other U.S. and international forestry institutions.

All of us hope that we and our colleagues contributed to the solutions of forestry problems of our day. We also hope that we left the organization better equipped to address the next generation of forestry problems. Those who follow us will, no doubt, reflect on those matters when their time comes.

As I read and edit this oral history, I am reminded of the omission of many names at all stages of my career that made those years so pleasant, stimulating, and, I hope, useful for the Forest Service and for forestry. I could not name all of you in any event, but I tried by way of example and anecdote to illustrate the issues that seemed important and otherwise influenced my career.

My thanks to all of you and my regrets for any disservice I may have committed.

Robert E. Buckman

Introduction

I knew Bob Buckman only slightly when I gave a lecture at the University of Oregon College of Forestry, where he holds a faculty appointment. A longtime history buff, he invited me to his office afterward for a chat. We agreed that a history of Forest Service Research would be useful, and he subsequently helped clear the way in the Washington Office for the proposal that would yield this interview and that of two other former deputy chiefs for research, Dick Dickerman and Keith Arnold. Previous interviews with George Jemison, Les Harper, Ed Kotok, and Clarence Forsling had provided first-hand accounts of Forest Service research, as seen by the deputy chief, and these last three would bring the story up to recent times. With Bob's in hand, we have a full half-century of research leadership on tape.

The interview took place in Corvallis in July 1992, in a small conference room in the Forest Service Experiment Station adjacent to the forestry school. We had worked together to construct the interview outline, and additionally Bob had prepared intensively. He came armed with an impressive stack of 4 x 5 cards that contained facts and figures in the same sequence as the outline. Frequently, he asked that the recorder be shut off while he reviewed his notes. Meticulous by nature, he provided carefully crafted responses to my questions. Later, as he reviewed the transcript, Bob reworked the text, line by line, until he was satisfied enough to send it back for final polish. Thus, what follows is his written narrative based upon the interview.

Robert E. Buckman was born on June 28, 1927, in Superior, Wisconsin. He earned a bachelor of science degree (1950) and a master of forestry degree (1953) from the University of Minnesota, and a Ph.D. (1959) from the University of Michigan. Following military service in both World War II and in Korea, and with his formal education well along, he began with the Lake States Forest Experiment Station in 1955, and he would remain there for a decade.

For Bob, the Lake States years were among his happiest, and he would have been content to stay. He spent much of his time studying red pine silviculture, along with prescribed burning and related topics. A plus was having M.B. Dickerman as station director; ironically, it would turn out that Bob would be Dick's successor as deputy chief for research. But that would be much later.

In 1965 Bob was transferred to Washington, D. C. to work in timber management research. He was awarded a mid-career sabbatical to earn a master's of public administration at Harvard. He wrote a major research paper, "Evolution of Science Policies in the Forest Service," showing an interest in history that remains strong.

When Bob arrived in Washington, Les Harper was deputy chief for research, to be shortly succeeded by his associate deputy George Jemison. Keith Arnold would be deputy when Bob was reassigned in 1971. Thus he was in Washington during a time of transition; Harper's long and seminal tenure was followed by a series a relatively brief appointments. Too the civil rights movement prompted a shift in personnel priorities, as did the environmental movement cause a reexamination of research projects. During this period, the experiment stations were reorganized so that fewer individuals reported to the director. Toward the end of this Washington assignment, Bob was responsible for overall research budget preparation and coordination.

In 1971 Bob was named director of the Pacific Northwest Forest and Range Experiment Station in Portland, Oregon. There, he was responsible for Forest Service research in Washington, Oregon, and Alaska with nine laboratories hosting about one hundred scientists. Some of the studies included the tussock moth, spruce budworm, prescribed fire, forest ecology, and hydrology.

His final Forest Service career move came in 1975; Deputy Chief Dickerman asked him to return to Washington to be his associate deputy. The next year, Dickerman retired and Chief John R. McGuire named Bob as successor. As it would turn out, Bob was deputy chief for ten years, as long as the combined tenures of his three, immediate predecessors. Only Les Harper (1952-1965) and Earle Clapp (1915-1935) served longer in that capacity.

As deputy chief, Bob was responsible for eight hundred scientists at seventy-five laboratories organized into eight experiment stations and the Forest Products Laboratory. Planning, coordination, and execution of a broad array of research topics was now his domain. He was also in the top agency leadership, participating in discussions and decisions on virtually

all major policies concerning programs, budgets, and personnel. He would meet with top-ranked members of the administration and testify before Congress. His watch included the transition from President Carter to President Reagan, with the attendant budget cuts of the latter administration.

New statutes were especially significant during Bob's time as deputy. The Resources Planning Act called for long term projections, which in turn required Research to provide specific information. The National Forest Management Act contained sections on topics like biological diversity, also generating need for scientific studies. The Forest and Rangeland Renewable Resources Research Act of 1978 provided specific authorization for current and planned activities. More and more, Congress affected more and more.

There were new initiatives in competitive grants, biotechnology, and research evaluation. Scientists were trying to determine the effect of acid rain on forests, they were studying endangered species, and they were coming up with ways to rehabilitate surface mining activities.

Bob retired from the Forest Service in 1986 but not from his profession. While with the agency, and fairly typical of deputy chiefs for research, he had been much involved with the International Union of Forestry Research Organizations. From 1976 to 1985 he had been a member of its Executive Board and also vice president. In 1987 he began a four-year term as IUFRO president; major issues included reworking the administrative structure, especially the secretariat, for a far-flung organization that contained 650 participating institutions from 106 countries. Priority was also given to creating special programs for the Third World.

During this same time and to date, Bob has been a professor of forest management at Oregon State University, on a half-time basis. He guides graduate students interested in forest policy and international forestry.

His schedule remains full.

Harold K. Steen
Durham, NC

The Early Years

Why Forestry

HKS: Bob, let's start with why forestry. I don't know what other options you thought about. I wanted to be an engineer or a geologist or a forester when I was in high school. What did you want to be?

REB: I wanted to be a forester and I knew it for a long time. I grew up in northwestern Wisconsin, a very rural part of that state, and I loved the out-of-doors. I had two role models, both uncles. One of them was a farmer, my father's brother, who would do anything to go fishing or hunting, including neglecting the farm. I was eager to be out with him because he brought a sense of excitement to the out-of-doors. The other uncle, on the maternal side of the family, had some college training at West Point. He dropped out of West Point because of the death of his father in a mining accident in northern Wisconsin. He joined the Forest Service in the CCC days. He was a technician and a general district assistant. He used to take me out on the Chequamegan National Forest to look at plantations and forestry activities. My interests in forestry crystallized when I was thirteen years old. I had to write a paper for an English class, "What Do You Want to be When You Grow Up." I still have that paper. It was then I knew I wanted to be a forester. And you know, despite all of the things that followed, I have never wavered in that interest.

HKS: I always wanted to be a forester until I was a freshman in high school. We had a book on different kinds of vocations, and it said you had to ride a horse to be a forester. And that was it. I never have liked horses and riding, so I almost didn't go into forestry.

REB: I see students today who can't decide what they want to do, and I reflect on how fortunate I was. However this was about 1940, and World War II was coming on, which caused some deviations in my career.

HKS: University of Illinois. What did you study there?

REB: I was in high school in the early l940s, and sometime during my junior year I read about ASTRP, Army Specialized Training Reserve Program. It was for seventeen-year-olds and was intended to give you college training. It was quasi-military because I wore a uniform but did not receive army pay. I was so eager to get on with life that I compressed my junior and senior years and actually graduated from high school in three years. Just a few days after my seventeenth birthday I was in the ASTRP in Champagne, Illinois, in civil engineering. This was an accelerated program designed to give college training to potential military people; accelerated in the sense that we were taking twenty-two to twenty-four credits each quarter. By the time I was eighteen years old I already had two years of college behind me. The war in Europe ended in May 1945 and in Japan in August and the ASTRP program folded. I went on then into basic training at Fort McClellan, Alabama. I was then just eighteen years old. I finished basic training toward the end of 1945. I applied for officer candidate school, was accepted and completed officer training in May 1946. So I was an eighteen-year-old second lieutenant in the Corp of Engineers. I was called Junior. I went on for a little more engineering training, and then went to Germany in August 1946. I came back to the U.S. in July 1947, after spending nearly a year with the Army of Occupation, headquartered in Frankfurt.

HKS: Did you have a chance when you were in Europe to look at any of the forests?

REB: A little, yes. I used to hunt in the forests surrounding Frankfurt, usually by myself because no one else was available who liked to hunt. I had a jeep and so could prowl around the countryside and hunt and fish, but never very successfully. Europe was a very grim and gray place in those days.

HKS: I remember the newsreels, all the bombed-out cities.

REB: Reconstruction hadn't started. Late in my tour the Nuremburg trials ended and the executions of Nazi war criminals took place. Ludwig Erhart became the economic minister of Germany and devalued the currency. The next day the shops were filled with goods. That was the beginning of the resurrection of Germany.

HKS: You were in Frankfurt, you were close to Carl Schenck. There were other GIs that saw him after the war. But you may not have known about him...

REB: I didn't know enough about forestry at that time. I saw the forests but didn't understand forestry principles or the foresters who contributed to the practices.

HKS: He was in Darmstadt, which is not very far south of Frankfurt.

Forestry Education

REB: The irony is that it was twenty-five years before I returned to Europe. I've probably been back a dozen or more times in the last ten years. I've seen the forests in much greater detail in these later visits. In 1947 I was discharged from the Army and promptly went back to the University of Illinois to convert my preliminary engineering training into forestry. Illinois had a two-year forestry program at that time. I completed that in one semester. Since Illinois didn't have a four-year program, I had to go somewhere else. I had my heart set on the University of Idaho in Moscow. I got there about two weeks too late to register for the courses required to advance my degree. It was with a lot of disappointment that I just couldn't afford to spend more time at the University of Idaho. In March 1948, I went to the University of Minnesota, which is close to my home in northern Wisconsin. As it turned out, this was a most salubrious choice.

HKS: Was Henry Schmitz dean there?

REB: No, Frank Kaufert was.

HKS: Okay.

REB: Frank, I think, had become dean just a short time before. But that first discussion with Frank Kaufert was only one of many with him over the next thirty years.

HKS: Frank was president of the Forest History Society.

REB: Yes. And you know what a warm person he was, and how supportive he could be. I experienced that relationship with him up to and including the time I was deputy chief.

HKS: Yes. We always thought that Frank and George Garratt were the last two deans that had authority over faculty.

REB: I'm not sure that Frank thought himself as an authoritarian. [laughter] Maybe the faculty did, although I doubt it. Frank Kaufert was very supportive of me. He must have thought that I had some small capacity to do things. He arranged for me to get the Minnesota and Ontario Paper Company Scholarship in 1950. He gave me a teaching appointment, and offered my name later for job references. I think that I had two or three job offers from various universities because of his interests.

HKS: At that time were you thinking academic as opposed to the Forest Service?

REB: It was still an option. We'll get to that in a minute. In any event I entered Minnesota in 1948 and completed my bachelor’s degree in March of 1950. That was a competitive environment because the GIs were back, mature and eager to get on with life. It was a great but arduous time.

I neglected one point, a mistake in my career. When I came back to the U.S. from Germany in 1947 I thought to myself if we ever have another war we're all going to be in it again anyway, so I signed up for the inactive military reserve in order to maintain my commission. The Korean War

HKS: Okay, that's a mistake.

REB: Back to the University of Minnesota. I completed my bachelor's degree in March 1950. Kaufert arranged a Minnesota and Ontario Paper Company scholarship for me. I was embarking on that program when the Korean War started in June. Can you see where this story is leading? I was recalled as a filler officer in an understaffed Mississippi National Guard battalion stationed in Camp McCoy, Wisconsin.

HKS: Wow.

REB: Shortly after I was recalled, Marie (nee Eidenshinck) and I were married. I met Marie in Minneapolis, where we both worked, she full-time and I part-time while at the university. Marie's home was Detroit Lakes, Minnesota, at the border between the Great Plains to the west and the forests and lakes to the east. We return there often, where Marie's mother is now in her nineties. Back to Camp McCoy. The core Mississippi battalion was a redneck, racist group. In fact, the battalion commander was a brother of the then governor of Mississippi, who had been the vice-presidential candidate on the States Rights ticket in 1948. Now the racial implications for me are a separate story.

HKS: Truman had desegregated the armed forces, officially.

REB: But that didn't touch the heart and soul of those Mississippi boys.

HKS: I'm sure.

REB: Anyway, there were actually some race disturbances at Camp McCoy. By this time, the battalion commander was sufficiently aware of my liberal racial views that he peddled me to a newly forming regular army engineer combat battalion. Another happy event at an otherwise unhappy time. My new regular army battalion commander was aware that my wife and I were expecting our first child. He said he would arrange for me to stay in the U.S. for one more month. At the end of that month I no longer had enough time remaining (two years was the maximum time for recalled military) to go to Korea, so I avoided it but just by a whisker. Thus I finished my second military assignment in the spring of 1952; both tours combined took nearly five years out of my forestry career. I went back to Minnesota and finished that master's degree over the next twelve months. During that time Steve Spurr was at Minnesota, and he was to have a significant impact on my career. Back to the University of Minnesota

HKS: I'm sure.

REB: I worked for Steve in Itasca State Park, Minnesota, that summer of 1952. My work included fire ecology, but Steve, you know, was also something of a mensurationist and a photogrammatrist.

HKS: When I was an undergraduate I used his photogrametry textbook and I thought that was what he was. I was surprised when I saw other books come out later.

REB: His interests were eclectic.

HKS: Yes.

REB: But he had a quantitative bent and an ecological one, and he was a stimulating guy to be around. In any event, I worked under Steve that summer at Itasca State Park, and he stimulated

my interest and curiosity. I completed my master's degree in 1953, and by that time Steve had gone to the University of Michigan. Then in the spring of 1953 it was a matter of deciding where I'd go. I was exploring some academic appointments with Frank Kaufert's help.

HKS: Dana was still dean at Michigan at that time.

REB: Yes.

HKS: Close to retirement but... Northern Rocky Mountain Experiment Station

REB: Very close to retirement, and Fontana was Sam Dana's replacement. So in the spring of 1953 there weren't all that many jobs. I talked with both the Forest Service and the academic community. Universities really weren't interested in a young person with only a master's degree. but the Forest Service was. My appointment in 1953 was with the Northern Rocky Mountain Forest and Range Experiment Station in Missoula, Montana. I joined Forest Survey. George Jemison was the director of the station.

HKS: Alright.

REB: And the assistant director I worked under was Harry W. Camp.

HKS: I knew Harry Camp.

REB: Dick Dickerman had just vacated the position that Harry Camp occupied. In many respects my later career was entwined with all three (Jemison, Camp, Dickerman). My work with the Northern Rocky Mountain Station was in Forest Survey and that meant exposure to a lot of country; we were taking inventory plots at four-mile intervals across the country. First, in the panhandle of Idaho and northwestern Montana and later in the Stanley Basin of southern and central Idaho. It was a marvelous experience, but it is one that you don't want to repeat for too many years. Then another thing occurred. There were rumors floating around, this was during the Eisenhower administration, that the northern Rocky Mountain Station might soon be closed. The rumors became more and more persistent, and one day George Jemison and Reed Bailey, who was then director of the Intermountain Station in Ogden, Utah, called the whole station staff into an office and announced the termination of the Northern Rocky Mountain Station.

HKS: Is that because of the economy, budget cuts, was that why it was terminated?

REB: No, I think it was part of Eisenhower's streamlining of government. I don't know all of the details, but Dick Dickerman might be able to tell you more. In any event, George Jemison announced that he was going to become director of the Pacific Southwest Station, Reed Bailey would remain the director of the consolidated Intermountain Station. For me personally it would have meant a transfer to Ogden, Utah, where I would continue with Forest Survey. I still had a year or so left on the GI Bill. I wrote Frank Kaufert and said that I had decided to go on for a Ph.D. at the University of Michigan under Steve Spurr. However, there were about six months remaining before the fall semester started at Ann Arbor, and I asked was there something I could do at the University of Minnesota in St. Paul. I got a letter back from Frank giving me a teaching assistantship. While at Minnesota, I also completed French, one of the two languages required for a Ph.D. A tutor located near the campus at the University of Minnesota guaranteed 95 percent success for his French language students after only fifteen days of instruction. But it required absolutely total immersion; the tutor would badger, harass, and intimidate people. I passed the exam.

HKS: John Hendee and I were in graduate school at the same time at Washington. He found a tutor, not quite that slick, but a tutor that tutored you only for that test, not anything about the language, but how to pass that test.

REB: I knew enough French after those fifteen days that I could have mastered reading skills on my own. However, the compelling reasons to do so did not exist. University of Michigan

REB: So, I went back to the University of Minnesota in March 1954, and spent six months then moved on to Ann Arbor, Michigan, where I joined Steve Spurr. With Spurr's help I was awarded a Rackham School Scholarship. The GI Bill and the scholarship permitted me to be a full-time student. That, plus our two children made 1954-1955 a marvelous time. My graduate committee consisted of Steve Spurr, Sam Graham, Ken Davis, Bob Gregory, and John Carow, all distinguished teachers and scholars.

HKS: Ken Davis was at Yale, maybe he was at Michigan some other time.

REB: No, Davis was at Michigan before he went to Yale. Steve Spurr was outstanding in several fields. Ken Davis was an authority on forest management, Bob Gregory was an economist with strong international connections, Sam Graham was an outstanding entomologist, and John Caron a mensurationist. It was a marvelous committee. I completed my residence requirements for a Ph.D. at Ann Arbor rather quickly, in nine months.

HKS: What was your specialty?

REB: At Ann Arbor?

HKS: Yes.

REB: Ecology and silviculture with a minor in the quantitative sciences, statistics and mathematics.

HKS: Because your work in Forest Survey was economic or statistical.

REB: Actually, Forest Survey for the most part was grunt work, it was climbing mountains and measuring trees.

HKS: Okay.

REB: Actually, during the winter months when the survey job was mainly office work, I did some of that mensurational work. But, ecology, silviculture, and quantitative sciences background were my specialities at the University of Michigan. I completed German in a couple of months while there. With the family we decided that we couldn't stay in Ann Arbor to finish the Ph.D. dissertation. About that time I received two offers from the Forest Service to come back. One of them was at Grand Rapids, Minnesota, and the other one was at Cordele, Georgia. F. H. "Windy" Eyre was the guy who was orchestrating this, that grand old man of forestry. For the family it was an easy, easy decision. Marie's family comes from western Minnesota and I came from northwestern Wisconsin. By then there were two grandchildren and four grandparents and, you know, it was just going back home again. And so we moved to Grand Rapids, Minnesota, with the understanding that I would do my dissertation research as part of my Forest Service assignment.

HKS: That was not that uncommon then, that you could do your dissertation as part of your assignment. Lake States Forest Experiment Station Grand Rapids, Minnesota

REB: Yes. And many weekends, holidays, and non-work hours were included, which was part of the job. We arrived in Grand Rapids, Minnesota, in the summer of 1955, and my boss at that time was Zigmund A. Zasada. He was one of the several people who had a significant impact on my career, and I'll talk about him and the others a bit later. In any event, Zig was the research center leader at Grand Rapids. He came out of the National Forest System--a quiet, low-keyed, unpretentious guy who could be just as stimulating and challenging as any person I worked for. Zig gave me one major assignment. I was to look after the upland forest research. We had

wetlands and swamp research and we had entomology and economics, but he gave me the responsibilities for looking after mainly pine and aspen research. And that's what turned into my Ph.D. research. I worked on growth and yield of red pine. I collected all of the permanent plot information I could find, primarily from Minnesota, but also Wisconsin and Michigan. I wanted to put that information together in a new approach to growth and yield forecasting for red pine. I also used some of Spurr's mensuration work. He developed a concept called the volume line which accurately predicted the volume of a tree or stand if you knew the basal area and height.

HKS: Was the concept of a normal stand still acceptable at that time? It was in the '30s, all those early bulletins came out...

REB: Yes, they were used, but they assumed fully stocked stands, which was not often a realistic assumption. I wanted to bring into the research the concept of variable densities. And, I wanted to bring some other things in too, like thinning methods; that is the removal of the largest or the smallest trees or some variation thereof. Furthermore, I wanted to treat growth as a differential equation. Now I'm into the mathematics part of my background. I wanted to treat growth as a differential equation and yield as integration of that equation.

HKS: What was that going to show you that we didn't know already? That was obviously a new way of looking at it.

REB: The growth equations did in fact deal with variable densities, and that was, I think, fairly new. That was the next generation of work after the normal yield tables. But the idea of integrating, that is, summing up those growth increments mathematically meant that you could track any one of a thousand varieties of management regimes. Frequent thinnings, light thinnings, heavy thinnings, variable thinnings, and so forth, and you could track them through time.

HKS: Was this based on real stands or hypothetical stands?

REB: It was based on growth plots in real stands. However, a good deal of the information that I had was imperfect, and that led to a philosophical difference with Zig about which I will comment shortly. In any event, that research turned into my doctoral dissertation and it was I think, far and away the most significant bit of research that I did. At that time it received a fair amount of attention. It was published as a USDA technical bulletin. But it was the methodology, not the growth forecasting, that many researchers followed. Interestingly enough, a colleague, Al Lundgren, who stayed in the Lake States, tracked red pine growth and yield for another twenty years. Al fed independent sets of information into those forecasting equations. They turned out to be remarkably good predictors, which was as much luck as good science.

HKS: And you did all that with an adding machine or a calculator.

REB: Essentially all of it except for development of the prediction equations themselves with the first computers, an IBM-650. But the point I wanted to make here is that those equations turned out to be just remarkably good predictors of independent sets of data. But I was lucky. Statistics and math don't serve all that well with highly variable field plot data.

HKS: Did that mathematical model work for something other than red pine?

REB: People used it for other tree species, but that was only a stop-gap measure until individual species equations could be developed. I ran into red pine equations being used for Sitka spruce in southeast Alaska. But we can come to that when we talk about the Pacific Northwest Station. In any event, the growth and yield research worked out reasonably well, and it attracted some attention from others such as Carl Ostrom and Dick Dickerman and maybe even Les Harper. I think it was that work that really tilted me toward the Washington office of the Forest Service, although I didn't realize it at the time.

HKS: I see. Statistics in the Forest Service

REB: Now I want to touch upon what I consider an intergenerational question in science, and it involves Zig Zasada. Zig came out of the National Forest System, and he was (and is) a remarkably insightful guy but with little formal training in science. His insights involved good judgment and intuition. Many of those growth plots that I used were just terribly inadequate in terms of statistical design. My concerns all came to a head with a famous old red pine plantation near Ely, Minnesota, called the Birch Lake plantation, about sixty acres of red pine that had been planted in 1918 or thereabouts. The trees in 1957 were eight or ten inches in diameter and sixty to seventy feet tall. The question at that time was what were we going to do with the Birch Lake plantation? I said let's install a well-designed stand density and thinning methods study. Zig said fine. So I laid out the experiment. I wanted it to be a very contrasty experiment; that is, very low densities and very high densities and several densities in between. I insisted that the study be replicated and that the treatments be assigned randomly. This is where the conflict occurred. Zig said, and representatives of the Superior National Forest agreed with him, that's all well and good except we don't want those low densities next to a road because we know that they're going to blow down or collapse in snow storms. I insisted that we observe all the principles of the experimental design. I did so because I was so uncomfortable with some of the permanent plot information I used in the red pine work that didn't observe those principles.

HKS: Did you ever deal with Les Harper? He talked about the introduction of regular statistical analysis in the '50s, and you were part of that, apparently.

REB: Yes, I think I was. But let me come back to your question.

HKS: But it wasn't typical of Forest Service research, it was more measuring and describing.

REB: My concern about this issue goes back to my undergraduate and graduate studies in statistical methods. I insisted that experiments be contrasty, that the treatments be assigned randomly, that every treatment have an equal chance of selection. The conflict in the Birch Lake plantation was one of visual effects of low-density treatment along a road. I knew that those heavily thinned plots were vulnerable to wind and snow, and as it turned out one of two of them were severely damaged by snow. But I insisted. This was a matter of principle for me. Art Greeley and Dick Dickerman, I think, knew about this boiling point, because they came to Ely and they visited the plantation. They didn't really talk to me about it but it was...

HKS: What was Art doing there?

REB: He was the regional forester in Milwaukee.

HKS: Okay.

REB: And Dick was the station director.

HKS: Right.

REB: I don't recall that I talked to Dick about it, but for me it was a matter of principle. I wasn't sleeping at night, this was such a major issue for me. But do you know that at the end of that time Zig said, Okay, we're going to do it your way. It wasn't a hostile response; it was that you made your case. Zig Zasada drew out of a hat the random assignments of the treatments. Zig is now in his eighties and still lives in northern Minnesota. His only child, his son John, chose forestry research as his career and has an office with the Pacific Northwest Station here in Corvallis.

HKS: How about that. Okay, Zig always challenged you.

REB: Zig had the capacity to challenge the dickens out of you. Often times he was right, but he also had the capacity, after extended discussion, to yield, and to yield gracefully. Zig and I have visited often over the intervening thirty-five years, sometimes rehashing the Birch Lake plantation issue. It was an important matter for me personally. I would not have stayed with the Forest Service had the outcome been different.

HKS: How did he get into research? I mean, he represents an earlier generation.

REB: Yes he did. The time that we're describing, which was in the late '50s and early '60s represented the arrival of the next generation of researchers. People with graduate training, Ph.D. training, meeting up with people who were recruited by and large out of the National Forest System to start a research program, to organize it, and to establish community relationships. It was exactly because research center leaders did those jobs that younger scientists could turn to modern research. I don't know whether you have ever heard that old shibboleth, if you need statistical design to prove a point, it probably isn't worth proving. But, that statement in my mind characterized those intergenerational problems.

HKS: I hadn't heard that. I worked for Dave Bruce at PNW, and he was a statistician from day one.

REB: Dave is an old colleague. I want to insert a point here. My recollection is that sometime in the 1930s there was a very small group of Forest Service researchers who recruited R. A. Fisher, Sir Ronald Fisher, of the Rothamstead Experiment Station in the U.K., to come to the U.S. Fisher, and that small Forest Service group, apparently created an interest in experimental design and statistics. I say that because while most people in the Lake States Station had only an indifferent appreciation of statistics, one of the experiments I worked on, a jack pine thinning study installed in 1940 near Aurora, Minnesota, portrayed all the principles of experimental design. I know it goes back to that Sir Ronald Fisher's visit and several Forest Service people: Ted Osborne of the WO, Tommy Evans, SE, Roy Chapman, SO, and Al Bickford of NE. There's a small chapter in Forest Service Research that really needs exploring, concerning the origins of statistical sensitivities and experimental design. It had much to do with improving the quality of research in the Forest Service.

HKS: If I remember correctly, when I interviewed Dave Smith at Yale a couple of years ago he talked about Fisher's visit. Fisher on a one to one basis or in front of a group was terrible. He literally turned his back to the audience and wrote on the blackboard, and he was boring; but his writing was so influential. I used Fisher as a textbook in the '60s; he was still influential then.

REB: Ted Osborne, who was in the WO when my career started, gave national leadership to the program. He was followed by Washington, a colonel in the reserves. I can't recall the name. But Tom Evans and then George Furnivall, now at Yale.

HKS: Who is the person that did all the cruising stuff in the South in the '50s, and prism, angle gauges?

REB: That was Lou Grosenbough.

HKS: Grosenbough.

REB: The point that I want to make here is that there were small beginnings of good solid statistical design even in the 1930s and early 1940s. Back to those Lake States days, there were conflicts between the old and the new, and Zasada was good at challenging young scientists and very gracious about yielding. I later put in several additional density experiments in red pine, white pine, jack pine and aspen, during my Grand Rapids years, that I think they would stand the test of modern day statistical and experimental design. Strengthening Forestry Research

REB: Les Harper had a profound impact on research programs at that time. Remember that I started in the middle '50s and Les was beginning to implement some of his ideas, and we felt that in the field. Dickerman and Zasada wanted to build a laboratory at Grand Rapids, Minnesota. At that time, we were working in an old beauty parlor above a hardware store. That's the way it was over much of the country. Harper and Jemison began to equate a laboratory construction program as a necessary adjunct to a growing research program. George Jemison deserves a great deal of credit for this. He wrote a paper called "Get Scientists Out of the Woodshed," which was the beginning. So one of the early laboratories in the Lake States Station, it may have been the very first one, was at Grand Rapids. It was dedicated in 1960. Zig was very active, I'm sure with Dickerman's encouragement, to mobilize political support for that laboratory. It was done and it was successful.

HKS: Do you think this is compatible with the Eisenhower philosophy that the role of the government is to assist and to help industry and so forth? Research would fit into that, but regulation and so forth would not. I mean the Forest Service made some big shifts in the '50s in terms of ways it viewed its forestry role.

REB: We need to keep in mind that there was a congruence of events that really favored research at that time. This was the time of Sputnik, when the U.S. felt terribly inadequate scientifically. It was also a time when the Forest Service, with a lot of help from people like Briegleb and Harold Mitchell in the South, were beginning to work directly with constituent groups regionally, to enlist congressional support.

HKS: Which was technically illegal...

REB: If you follow some of these histories, both the written ones and the oral ones, you'll see a lot of euphemisms, and I'll probably use some as well. But it was lobbying, and it was lobbying sometimes in violation of the Hatch Act, which says that federal funds will not be used to influence legislation, but it was done. And it was oftentimes done with a great deal of encouragement from members of Congress and from constituent groups.

HKS: Would the Hatch Act have allowed Senator Humphrey to invite foresters out on a show-me trip?

REB: Absolutely.

HKS: If it's initiated from Congress, it's okay.

REB: Yes. If Congress or the administration gave even a pretense of legitimacy, if they requested information, it was not in violation. Frequently things were, by mutual consent, manipulated to do just that. That movement toward research centers and working with local constituent groups really began shortly after World War II. It came out of the Southern and the Southeastern Stations. So, Zasada and Dickerman were using that same approach to help build programs, and I'm sure that Harper was very much encouraging it. Back to my original point about strengthening research programs. There was a congruence of events in the 1950s. I don't think Eisenhower had anything to do with it. It was a sensitivity to interests of local groups, a decentralization of the research programs into regional experiment stations and satellite laboratories. There's still one more thing that made it all come together and that was the fact that Les Harper was an extremely astute mobilizer of programs, people, and events to make things come together. Harper was very comfortable with a number of key senators such as Stennis of Mississippi, Hayden of Arizona, and Russell of Georgia. The climate for accelerated research was favorable. Harper developed a program for forestry research that gave a background and legitimacy to the expanding research program. But Harper himself was also a key. Dedication of Grand Rapids Laboratory

REB: In any event, the Grand Rapids laboratory was dedicated in 1960, and the dedication ceremony included Chief Richard McArdle. Senator Hubert Humphrey was also invited.

Humphrey was then campaigning around the state. It was my job at the dedication to be away from the platform where the ceremonies were taking place and to welcome guests. Humphrey was late. I looked down the road and I saw a big black Buick that I recognized; the driver was George Parshall, a technician in blue bibbed overalls then with the state of Minnesota Forest Service. It turns out that Humphrey had radioed the local airport, and the state Forest Service had sent George Parshall out to pick him up. As the car came up the road I met them, and said to Senator Humphrey that I would escort him to the platform. Humphrey was in a vigorous conversation with George Parshall, a warm and animated conversation. The reason I mention this is that my admiration for Senator Humphrey soared, because it was apparent that he was a warm and thoughtful person, and, as you know, had a profound influence on forestry. When the dedication ceremony was completed, McArdle and Humphrey walked through the laboratory (you might want to ask Dick Dickerman this story, too, because he has repeated it to me), and Humphrey asked McArdle, "How are things going, Mac?" McArdle said, "Senator, I've got troubles. The Multiple Use-Sustained Yield Bill is locked up in committee." Apparently they talked about it a bit more, and Humphrey said, "I'll see what I can do." Dickerman and McArdle then left the ceremony and drove back to the Twin Cities. McArdle stopped along the way to call his office; I think it was Ed Crafts that he was calling to ask where the Multiple Use-Sustained Yield Bill stood. Finally, after a number of calls, Ed Crafts replied that it had broken out of committee.

HKS: Didn't Humphrey introduce the Multiple Use Bill?

REB: He may have. But it became stalled in committee, and it was that dedication event that broke it free, one of the many ways some of these forestry and political issues get resolved. I was to observe many variations on this theme in the years ahead. Appointment as Project Leader

HKS: Given the way your career developed, do you think you were a typical research scientist at the time? Did you have broader interests, were you looking left and right rather than just going to your laboratory?

REB: Maybe that's right, but I didn't plan it that way, nor do I trust my objectivity on that question. The ten years at Grand Rapids were most rewarding and satisfying to me. And I'd like to come back to that a little bit later. But maybe, just maybe, I had some small instincts for interorganization and interpersonal relationships that not all scientists have. I didn't plan it that way, but maybe there were a few things that took place that reinforced that impression on those who influence career pathways. The dedication of the Grand Rapids laboratory took place in 1960, and Harper and Jemison were moving ahead on that construction program. Zig was a proven commodity because he had mobilized the support for the Grand Rapids laboratory. So Zig was invited to join Harper's staff, and it was a mystery about who was going to take his place. We were at a farewell party for Zig Zasada about two days before he was to fly to Washington, and none of us, the nine or ten researchers at the laboratory, was bold enough to ask him who was going to be his successor. Frankly, I did at the going-away party. I said who's going to be your successor, Zig? He replied that I was. That was two days before he departed for Washington. That came as a great surprise to me because I was doing research and I was very happy.

HKS: All your time at the Lake States was in Grand Rapids?

REB: All of it, except that I was in proximity to the station in St. Paul as a student at the University of Minnesota in the late 1940s and early 1950s. So I knew a little bit about the station. From Research Centers to Project Research

REB: I want to use that juncture, the dedication of the laboratory and the departure of Zig, to mention the first of three internal reorganizations that I witnessed in Forest Service Research. This one goes back to the McKenzie Report in the mid-1950s. It was a study of the organization of forestry research. At that time we were organized into research centers, where the center leader would be located in a satellite laboratory to the main station. The center leader was responsible for everything--community relations, science, everything. The McKenzie report, as I

recall, recommended a continuation of the research centers. But Les Harper was not comfortable with the report findings. Les and I have exchanged correspondence about the event. He felt that there was too much overhead, that we weren't really emphasizing research quality. He wanted to go to a concept called the project organization. His views prevailed. The departure of Zig from Grand Rapids coincided with the organizational change at Grand Rapids from a center to a project concept. I became one of four project leaders at Grand Rapids. My project was the largest--six scientists, including myself. My responsibilities were silviculture of upland pines and aspen. I was also the director's representative, which meant I was the unofficial chairman among the four project leaders to resolve internal and external problems for the Grand Rapids Laboratory. There was lots of discussion in those late '50s and early '60s among scientists about how we were going to reorganize. I was in favor of the reorganization because my background and training leaned heavily toward science. I could embrace that project leader's job enthusiastically, because I could continue my research. That concept was adopted all over the country, and I consider it to be a significant juncture affecting the quality of Forest Service Research nationwide.

HKS: Is that what Harper calls the Man-on-the-Job?

REB: No, that was something separate.

HKS: Okay.

REB: In any event we went from a research center to a project concept. It streamlined administration and put a lot more emphasis on science. Coincident with that was the development of the Man-in-Job concept in the Agricultural Research Service. Les Harper saw the significance of the concept and adopted it, which meant that a researcher's career was dependent on what he produced, not on his organizational position. That just has to be another one of those major milestones that upgraded the quality of Forest Service Research.

HKS: Getting that through Civil Service and all the other bureaucracy must have been quite a battle.

REB: Oh, it probably was. The Agricultural Research Service deserves a great deal of credit for generating what is now called the Person-in-Job concept.

HKS: I understand.

REB: I came to realize later that the Person-in-Job complex complicated the life of an administrator because it provided a two-track career ladder for scientists. Sometimes that situation made it difficult to recruit people into research administration who were also doing well as scientists. If the two-track career system had come along a few years earlier it might have posed a dilemma for me too, because I liked doing science.

HKS: Was it used--I'm not sure how to characterize this--as a place to put some of the master's level senior scientists at that time, because they really weren't very good scientists by the new standards?

REB: Some of that happened. However, still another innovation of the Harper/Jemison era was the Government Employees Training Act (GETA). Harper and Jemison and all of their successors, including me, very much encouraged the stations and the projects to take advantage of GETA. So if people came in with master's degrees and displayed an interest and a capacity for science, it was very easy to encourage them to go on for a Ph.D. Many scientists did that in the '60s and '70s.

HKS: I know. I was at the PNW in the early '60s, and they were going to send me to Yale to work under Bill Reifsnyder. I finally decided no, I wanted to be a historian, so I resigned the agency and went back to grad school in history. I didn't realize how new the program was in the mid-'60s.

REB: This is another one of those Harper/Jemison areas of emphases. I was so interested in these policy developments that I wrote a paper on them while at Harvard in 1968-1969. I sent you a copy of that paper.

HKS: Yes, I was going to ask you about that later.

REB: In it I recount a good many of those things that occurred at that time. Back to the early 1960s. I became a project leader as we moved into that new organization concept; those were some of the best years of my life. I had more control over budgets, equipment, facilities, and technicians. My research productivity wasn't all that bad. I was writing four to six papers a year, and I had that USDA technical bulletin on growth and yield. I was also doing fire ecology and prescribed burning research. I never sought to leave Grand Rapids, but I said that if I were to leave, I wanted to do something very much differently, I didn't want to go someplace else and do growth and yield and fire and fire ecology. I wanted to do something entirely different. And I was beginning to get inquiries about a change in jobs. Fire Research

HKS: Fire. Do you want to comment at all on Ashley Schiff's allegation--his book came out about 1964--that the Forest Service administration was, if not censoring, at least controlling release of research data during the '30s that showed that fire was good. What was your feeling at the time? Was it controversial? Were people mad or did they shrug it off?

REB: You should ask Dick Dickerman that question too, because he visited with Ashley Schiff and so did I. Schiff, in my estimation, was doing research in the tradition of Harvard, kind of a polemical, iconoclastic approach with sensationalism built into it. I think there were some ingredients of truth in what Schiff was saying, but I really think he made a caricature out of what was really a relatively minor problem. My view on this is that the first step in forest conservation, beyond the establishment of the national forests, was to protect forests from fire. Forest fires were the major cause of forest loss nationwide. We had to get that under control, especially in the southern United States, where arson and agriculture and all of those things were a way of life. It was the Weeks Act of 1911 and the Clarke-McNary Act of 1924, and the creation of state forestry organizations, that were absolutely essential. I tend to be more charitable about the role of state foresters and Forest Service people at that time than as described by Schiff. They had an enormous educational problem, and they were terribly concerned about sending mixed signals to people. It didn't take very long before fire, prescribed fire and controlled fires, became a way of life in the South. Schiff never gave any credit to that.

HKS: He was tempted, I am sure, by having someone as quotable as H. H. Chapman. Chapman let it all hang out.

REB: I don't recall...did Schiff work with H. H. Chapman?

HKS: He was one of the people who believed in prescribed burning in the '30s, so he was one of the antagonists in the book.

REB: H. H. Chapman could be pungent. By the way, H. H. Chapman came back to the University of Minnesota for one semester in the 1950s, and I took a course under him. He was a lousy teacher but an inspirational leader.

HKS: Is that right? Unorganized? What was the problem?

REB: Not organized. Have you read any of his books?

HKS: No.

REB: Steve Spurr tells a story about H. H. Chapman. Chapman was lecturing based on one of his books, when a student asked him what he meant on a certain page. Chapman read the page, paused, and then tore the page out of the book. He then gave the student permission to do the same. In any event, Chapman was a stimulating person. Did you know that Chapman was a graduate of the University of Minnesota about 1898?

HKS: I didn't know that.

REB: I think one of his very first, if not his first, forestry efforts, was to establish a red pine plantation on a recently burned area near Grand Rapids, Minnesota. He came back to visit that plantation on several occasions, I'm told, but never while I was at Grand Rapids. The plantation, now nearly one hundred years old, was within easy walking distance of my office. It was the start of Chapman's long forestry career.

HKS: He was quite a guy.

REB: Chapman continued to be influential in Minnesota. Was it the Morris Act that created the Chippewa National Forest?

HKS: I'm not sure.

REB: Chapman had a lot to do with silvicultural practices on the newly created Chippewa National Forest, which did not come out of Indian lands. Pinchot was a visitor to that area, by the way. The Chippewa National Forest was different than most, very special. Chapman's contribution had to do with leaving first, 5 percent of the old growth pine; later, 10 percent, as seed trees. Some of those reserved trees are still standing.

HKS: I distracted you by talking about Ashley Schiff.

REB: I think that Ashley Schiff over emphasized, somewhat unfairly, his point. I came to realize that later as I worked under the same professor as did Schiff (Professor Arthur Maass) at Harvard, Maass created an aura of sensationalism that often made a caricature of an issue.

HKS: *Muddy Rivers* or *Muddy Waters*?

REB: That's exactly right, the same Arthur Maass.

HKS: A very dull book to read, I thought.

REB: Which one, *Fire and Water?*

HKS: No, Maass's book on *Muddy Waters*.

REB: I didn't read *Muddy Waters* but I took a course under him and read *Fire and Water, Scientific Heresy in the Forest Service*.

HKS: *Muddy Waters* was assigned to me in grad school.

REB: I don't think he ever made the case for water as he attempted to do for fire. One of the interesting points about that book and your question however, is that the Smokey Bear syndrome continues to come back over and over again. Smokey Bear becomes the enemy because he is perceived to stand in the way of controlled or prescribed use of fire.

HKS: The Yellowstone certainly was on the nightly news.

REB: The problem is not Smokey Bear; the problem is the operational difficulty that goes with the use of fire. If we would quit tying a can to Smokey Bear's tail, we might get at some of those operational questions, for example, the risks and the rewards system, the narrow weather windows that we have for the use of fire. The sanctions that go with the maladroit use of fire are far greater than the rewards that go with the proper use of it.

HKS: Are you watching with interest the prescribed burning the Forest Service is doing in Wallowa's? I only learned about it two days ago. All the bug damage and the fire build up and all of the...

REB: The eastern Oregon forests are a mess. I want to come back to the question of prescribed fire when we talk about the Pacific Northwest.

HKS: Sure.

REB: Because I felt very strongly about the ecological role of fire and its benefits to forestry. It came out of those Grand Rapids experiences. Back to those formative years at Grand Rapids. If I changed jobs I want to make a big change. In the meantime (I'm just guessing that Dickerman engineered some of this), Dick encouraged Harper to visit the Lake States Station. Dick very carefully arranged for Harper to meet what he considered to be some of the more promising people in that station, especially during a canoe trip in the Boundary Waters Canoe Area. Bob Lucas, who became a wilderness researcher, was one of those people; Roger Bay, who became the director of the Intermountain and of the Pacific Southwest Station, was another and I was involved also. And Carl Ostrom, director of Timber Management Research in the WO, came out and was also to have a major influence on my career. Carl visited field experiments and I'd talk about experimental design, contrasty treatments, the creation of response surfaces and research methodology. I think maybe that caught his attention as did the publication on red pine growth and yield. In any event the invitation to Washington did occur, and I went there as branch chief of mensuration under Carl Ostrom. McIntire-Stennis Act.

HKS: McIntire-Stennis was enacted while you were at the Lake States. Was this controversial, were you waiting for it to happen, or did it sort of ease in and you learned about it and started making use of it?

REB: The McIntire-Stennis Bill was peripheral to my interests at that time. But my contacts with Frank Kaufert were sufficiently close that I knew that he was one of the major progenitors of that act. He was working with Professor Westveld, who was at Missouri. There were two Wastrels, one in Missouri and the other in the Northeast.

HKS: I'm not sure which one.

REB: Frank Kaufert was a major shaker and mover in the enactment of McIntire-Stennis Act. Frank was also working with Bill Cummings, formerly with TVA, on a study on forestry research needs in the United States. Sponsored by the Society of American Foresters, Kaufert and Cummings came out with a book in the mid-'50s having to do with forestry research. I'm reasonably sure that the SAF study had much to do with Kaufert's interest in what became the McIntire-Stennis Act of 1962. If you read the Harper comments on the formation of the McIntire-Stennis Bill in some of that correspondence that I sent to you, you may recall that the final hang-up in the McIntire-Stennis Bill was whether the program would be administered by the Forest Service or by an independent agency. That agency today is the Cooperative State Research Service (CSRS). In other words, McIntire-Stennis would be administrated separately from the Forest Service. An industry group very late in the congressional deliberations insisted that McIntire-Stennis be administered outside the Forest Service.

HKS: Why was that? Just the traditional distrust of government.

REB: I suspect that it had a lot to do with distrust of government. But you also know better than I that there was a lot of hostility to the Pinchot philosophy that carried way up until the 1950s about federal regulation of private lands. I suspect that hostility was also involved in the McIntire-Stennis Act that was in the *Journal of Forestry.* Harper mentioned to me in one of our informal exchanges that he had been mentioned in the article, but he insisted that his name be removed. Harper indicated to me that he was a far greater contributor to the passage of McIntire-Stennis than he'd given credit for because he insisted that his role be downplayed. I don't know whether Harper wanted it in the Forest Service or as an independent program. My own view, developed in later years, was that the Forest Service was fortunate indeed that McIntire-Stennis was administered independently of the agency. It made for much more productive and fruitful working relationships between the Forest Service and the forestry schools.

HKS: That's something that I wanted to go on into, that is the need to coordinate Forest Service and university research. This laboratory of the experiment station (Corvallis, Oregon) was built in 1960, that's two years before McIntire-Stennis, so there's already obviously cooperation with universities.

REB: Yes.

HKS: But this law made a mechanism for what? For funding? Or for projects?

REB: It authorized funding for forestry research and encouraged cooperation. I wonder if you could leave that set of questions until we come to my early years as deputy chief, because I really emphasized those relationships during that time. Would you please permit me to touch on a couple more points from my Grand Rapids days that influenced my thinking in later years.

HKS: Absolutely. Research and Policy Conflicts

REB: One of the issues of the late '50s and '60s was the Boundary Waters Canoe Area (BWCA). That was one of the first hotbeds of the wilderness issue. The BWCA was set up under special legislation. One of my colleagues at that time was Myron L. "Bud" Heinselman.

HKS: The name is somehow familiar.

REB: Bud Heinselman was a talented ecologist, did some marvelous work in fire ecology and in peatlands ecology.

HKS: Is this the area that Truman by executive order prohibited over flights?

REB: Exactly.

HKS: That's pretty early.

REB: Yes, and this was in the late '50s and early '60s. Bud Heinselman was a lifelong user of the BWCA and was very much environmentally oriented. The BWCA was set up in such a way that the canoeing, the water based recreation, was partially screened from timber harvesting that was going on beyond the buffer zones. There were lots of people, including me, who really thought the BWCA was a treasure that ought to be protected. The timber harvest there was heavily subsidized. It was a time when the Forest Service might get fifty dollars stumpage per acre for the jack pine but would pay one hundred dollars per acre to reproduce the forest.

HKS: So reproduction was the problem, it wasn't the harvesting costs, road building and so forth.

REB: Oh, they played a role too, but the main problem was that regeneration didn't come easily.

HKS: Aspen would take over or what?

REB: Aspen and shrubs would take over. Red pine was the preferred species for reforestation. Jack pine was acceptable but it was very short-lived and commanded lower stumpage prices. And in many respects it was an argument about below-cost timber sales not different from the ones I heard thirty years later. The point that I want to make is that instinctively, philosophically, intuitively, Heinselman wanted the BWCA enlarged. That was my first encounter with conflicts between Research and the National Forests System.

HKS: I see.

REB: Heinselman was considered the villain in this relationship. The supervisor of the Superior National Forest and the regional forester and other Forest Service and industry people really had an antipathy toward Bud because he was violating Forest Service policy.

HKS: But they weren't opposed to the idea of enlarged...

REB: Yes they were.

HKS: Oh, that too.

REB: At that time, by and large, they felt that the Forest Service was on a reasonable course of multiple use where recreationists could use the water and industry could use the timber. That situation made things very difficult for me, but even more difficult for Heinselman because he was using all of his free time to lobby for the BWCA but was using his working time as a very productive scientist. I used to talk with Bud about the dilemmas. Instinctively I shared this view. Why should we spend one hundred dollars an acre when we only get fifty dollars back.

HKS: That's right.

REB: That was a major conflict in Minnesota and for the Forest Service I think time has vindicated Heinselman. I encountered similar conflicts between policy and research in later years, but I'm not sure that any of them were more acrimonious than this one. A few years after I left the Lake States Station, Heinselman arranged with the station director on a change of assignment which meant that he could decline and take early retirement. Bud's internal conflicts were so great that he felt that he had to leave the Forest Service. I thought that was an appropriate and an honorable thing for him to do. Of course the BWCA was established as a special wilderness area and significantly enlarged.

HKS: A book came out in the mid-'70s on that, won our book award.

REB: I'm told that Bud is now writing another book recounting the origins of the BWCA.

HKS: Does this go across the Canadian border?

REB: Yes it does. It used to be called, as I recall, Quetico-Superior Wilderness Area.

HKS: That's right. An Exciting Research Environment

REB: The Canadian side of the BWCA might be even larger than the U.S. side, and it is also a national treasure. Another point that I wanted to make about the Grand Rapids years was the excitement that went with the synergism that goes with working with unusually stimulating and able people. I used to inquire about this in later years as I visited various laboratories. Where are the centers of excitement and ferment? I think we had some of that at Grand Rapids. There were ten scientists during my time in Grand Rapids and several that were unusually stimulating and able. Roger Bay, who later became director of Intermountain and the Pacific Southwest stations,

was one, Bud Heinselman who was an outstanding ecological researcher was another. So was Al Lundgren, an economist, and Bob Wambach, who later...

HKS: ...went to Missoula. I knew him there.

REB: Bob was a member of that group. Did you know Bob?

HKS: Slightly.

REB: A stimulating guy, but undisciplined. One of the most stimulating persons I have known.

HKS: I thought I was going to land a job teaching at Missoula with...

REB: ...with Bob?

HKS: Right, after I got my Ph.D. It didn't work, I wound up working with the Forest History Society instead.

REB: The point I want to make is that quite by accident there was a great deal of intellectual ferment among that group of ten. I think it's more a random event than anything else. Somehow a group of scientists got together who interacted extremely well. Several of those folks went on to have distinguished careers in their own right. I saw the ferment in other laboratories in later years and tried to offer administrative and financial support where I could.

HKS: Does that reflect on Dickerman? Does the station director select the people like that? Were they all there because he invited you guys to be there or what?

REB: I'm not sure, I think it's a question to ask Dick. Dick, in my estimation, was an astute judge of people. He had two centers in those Lake States days that I thought were exciting places. One was at Rhinelander, Wisconsin, and the other was Grand Rapids, Minnesota. There was some chemistry and synergism among people that made them exciting. I saw that happening elsewhere in the country. For example, Lake City, Florida, produced just a great number of unusually able people; Harper was one of the people who went through Lake City. I think now it's called Olustee. Carl Ostrom was there as were Karl Wenger, Francois Mergen, and many others. One sees those creative centers and you wonder why. What is it that makes one place more creative and exciting than another? This Forest Service in Corvallis, which is a fairly large one, also has some of those ingredients. It's big enough that it may have two or three subcenters, for example, in ecology, entomology and genetics. It was something I've asked myself about through the years, why is it that some places are so much more productive and stimulating than others. I think it is people and their ability to stimulate and reinforce one another. It's also distressing to see once productive centers revert to a lower level of performance. It is a major administrative responsibility.

HKS: Sure.

REB: I think it is people more than the work environment. But how you attract people like that, I don't know. Some leaders attract good people or otherwise are more able recruiting them. Still there is a luck-of-the-draw element also. *Silent Spring.*

HKS: You may want to deal with this concept a little later in your career, but in 1962 *Silent Spring* came out. That must have had an impact on research. I don't know how immediate it was. Did biological research become more fashionable because of Silent Spring?

REB: *Silent Spring* didn’t really impact me directly because I wasn't in that area of research at that time. I certainly knew about the book, and I know about its consequences. I probably became more involved with *Silent Spring* after I became director of the Pacific Northwest Station and...

HKS: It became an icon eventually.

REB: Yes.

HKS: Congress supposedly would have been more amenable to increasing budget requests toward certain kinds of research because of *Silent Spring*.

REB: Yes, and that did have a profound impact on Forest Service budgets. I don't recall whether Jemison or Harper mentions that in their papers. Dickerman and Arnold can comment on that better because they were in more senior positions at that time.

HKS: Maybe because you didn't have severe bug problems, right? And that was sort of the first use of DDT insect control. Raphael Zon

REB: That was the first issue that I was confronted with, DDT and the Douglas-fir tussock moth, when I became director of the Pacific Northwest Station. Permit me to defer this discussion. I want to make one more reference to my Minnesota years. As a student at the University of Minnesota I was very much aware of the Lake States Station, and I certainly knew about Raphael Zon. And I probably saw him on the campus in the late '40s and early '50s, but it didn't register. After I joined the Lake States Station at Grand Rapids in the mid-1950s, I occasionally went to St. Paul. On one of those visits at a Christmas party, a very old man was introduced to the group. His name was Raphael Zon, very frail and old. That was the only time I ever recall seeing him. Less than a year later, Zig Zasada, who was still center leader at Grand Rapids said that he had been asked by Dick to scatter Raphael Zon's ashes on a set of plots that Zon had helped establish in 1926 on the Cutfoot Experimental Forest. Zig scattered the ashes and later remarked to several of us that scattering the ashes was okay; it really didn't bother him but discarding Raphael Zon's glasses was more troublesome. You may recall from photographs that Raphael Zon wore those little round glasses. I knew at that time, and of course Zig and Dick did too that Raphael Zon's influence on forestry research went back nearly to the turn of the century.

HKS: Sure.

REB: But Zon spent the last half of his professional life as director of the station. Soon after his death I became the project leader, and Dick Dickerman and I talked about some kind of a memorial for Zon. What should we do? One day Dick sent me a longhand note on a half-sized sheet of paper, written in ink, and, paraphrased, it said: "GP. I have the pleasure of transferring to you a plan for experiment stations." At that time both Dick and I realized that we had some ingredients for a monument to Raphael Zon. With help from the Chippewa National Forest, we arranged for a very large field stone, more than six feet high, to be placed next to the plots where Zon's ashes were placed. A bronze plaque was cast on which the words of the Raphael Zon letter to Gifford Pinchot were inscribed. Those events surrounding Zon's life triggered my interest in the roots and origins of Forest Service Research. It's a story that both Dick and I use when we give talks on history of the origins of Forest Service Research. Zon, among others, deserves a great deal of credit for creating what are now the regional experiment stations of the Forest Service.

HKS: Pinchot created an image of himself that really was false in that he was totally practical, he was a field person. He would brush the cow chips out of the pond and drink the water. But under his administration the Forest Products Lab was established. The Office of Silvics, it was called, with Zon and Sam Dana, and it did a great deal of research. But Pinchot didn't want to call it research because he didn't want to look like he was a professor or something. He wanted...

REB: One of the accounts that I have read is that 25 percent of Pinchot's work force in the first year or two after he became bureau chief was in investigations in silvics, timber physics, and so forth. I'm asking you, why did Pinchot want to disassociate himself from research?

HKS: Part of it was he wanted to show he was hands-on. When you look at the political cartoons of the western papers like the *Denver Post* when they were opposed to the conservation movement, they always called him Professor Pinchot. That was a pejorative to call him Professor Pinchot. He didn't just want to say I'm a scientist, I'm doing research, because that added fuel to the western fires in opposition to the conservation movement, so he downplayed research.

REB: And yet he created an environment for research...

HKS: Absolutely.

REB: ...and the history of the Northeastern Station gives Sam Dana credit for the creation of Fort Valley in Arizona.

HKS: That could be.

REB: Now apparently Sam Dana and Raphael Zon worked together in the Office of Silvics. Sam Dana was actually at Fort Valley when Raphael Zon arrived there in 1908. The Northeastern Station history gives Dana credit for the creation of Fort Valley. It probably was a joint undertaking between Zon and Dana.

HKS: Yes.

REB: I've wondered about the same point that you've just made. Why is it that so many early scientists and progenitors of research found a home in the Gifford Pinchot years.

HKS: Silcox, all those guys were active under Pinchot. Pinchot wanted a vastly different image, like Albert Potter in range. He wanted people who actually knew how to ride a horse and that stuff.

REB: Okay. That was the final story of the life of Raphael Zon, and it came to an end on the Cutfoot Experimental Forest for which I had some responsibilities.

HKS: He wrote a letter to FDR about shelterbelt. Zon did a marvelous number of things.

REB: You'll want to ask Dick about that because Dickerman worked as an assistant under Raphael Zon when Zon was drafting parts of *Breaking New Ground*.

HKS: Okay.

REB: Dick will tell you about some of Zon's left-leaning tendencies and his lack of protocol in dealing with high-level administration officials.

HKS: Henry Clepper told marvelous stories about Zon, but I'll leave that for Dickerman. Zon picked Clepper in 1937 as the head of SAF. Zon was, I guess, editor of the journal or president of SAF at that time.

REB: He may have been both.

HKS: That's really all I have of the Lake State years in my outline.

REB: That ends my comments as well. Those were still impressionistic years that strongly influenced my views for the remaining two-thirds of my Forest Service career.

HKS: So what happened? You liked Grand Rapids, you're doing good research and everything is great for ten years. What was the incident that caused you to go to Washington? The Washington Office, 1965

REB: I don't think I ever made an overt gesture to change jobs. I only had one personal requirement, that if I changed jobs I wanted to make a major change, not a minor one, not the same work somewhere else. Several inquiries came along. The one that said Washington, D. C. was from Carl Ostrom, director of Timber Management Research.

HKS: You went back there to do research, not to be in management?

REB: No, I went back there to head up the branch called Forest Mensuration, and it was really a very small program. I came to realize in later years that those invitations were oftentimes not to deal with the specific tasks that you were assigned. They were for you to do a variety of things, for you to size up that work environment, and for others to take stock of what and how well you performed in a variety of jobs.

HKS: You didn't see it as a lessening of your interests as a scientist?

REB: No, at that point I didn't. Later on, in retrospect, I did. In any event, three of us from the Lake States Station went to Washington roughly at the same time. Bob McCulley in 1964, and Dick Dickerman and I in 1965. Bob McCulley was another one of those people that had a strong influence on my career. He had been the assistant director responsible for my program in the Lake States Station. He went into a staff position under Harper. He later went on to the Pacific Southwest Station as director. But Bob was a good counsel both in Minnesota and in Washington. He was another one of those crusty guys that would challenge the hell out of you and then it was all over say go to it. Dick Dickerman, very much senior to me, was also most helpful in the new environment. My new boss was Carl Ostrom. Carl had been assistant director of the Southeastern Station. He was a great developer of people; he had that ability to tutor, to help steer and develop you but not frustrate.

HKS: Wasn't he an economist? Washington Office Environment

REB: No, he was a silviculturist, and a good one. Came out of the Southeastern Station. He was a great person to work for. Quickly my limited assignment as branch chief of mensuration research enlarged into things like assistant director for timber management research and a person available for a variety of assignments. At that time timber management research included genetics, silviculture, timber related crops, forest mensuration and so forth. A number of people who later had distinguished careers came through those offices, people like Tom Nelson, John Barber, Steve Boyce, Karl Wenger, Bob Callaham, and others. In any event, I went to work for Ostrom. My first year there was extremely troubling. I kept asking myself what have I done, because I didn't understand that work environment. It was a jump from a very rural location in Minnesota to Washington, D.C.

HKS: Lyndon Johnson is now president, we have civil rights, we have Vietnam, and then Washington, D.C. is a whole different environment, you're suddenly in the middle of a whirl rather than out there in Grand Rapids.

REB: Washington, D.C. wasn't as foreign to me as it was to other Forest Service people because I had been in Officer Candidate School at nearby Fort Belvoir in '45 and '46, so I knew the city, and it wasn't intimidating to me. It was the work environment about which I was extremely uncomfortable. I remember that one or two occasions I was so unsure of myself that I would take long walks in the Mall just to ask myself whether I had done the right thing. I saw similar concerns among WO recruits during my time as deputy chief; most, but not all, eventually adjusted as did I.

HKS: These were administrative challenges rather than scientific challenges.

REB: Yes. One of the impressions I brought with me to the WO was that it was D.C., it's going to be very procedurally oriented, people will know what they're doing, what the protocols are and so

on. It took me a year or so to discover that exactly the opposite was true. That the Washington office of the Forest Service is far more unstructured than any field organization.

HKS: Why is that? Too much power?

REB: No, I think it's because of the fluidity, the fluidness of the environment in which one works. Fast moving situations. Issues can come into the agency from anywhere, from Congress, from the White House, from constituent groups. The most important business in Washington is conducted with longhand notes and personal conversations. The memos, the memoranda and the published stuff are not the important decision points as I think you well...

HKS: That's right, we historians use the published stuff and the official documents.

REB: But it took me a year or so to recognize that, and it was a point that I built on a lot in later years, that what you're looking for are those people who can cope with that kind of unstructured environment. Not everyone can. There's a cyclical quality to the Washington office; you do some of the things year after year geared to the rhythms of Congress and the White House. I became increasingly comfortable with that environment, and Ostrom and Jemison who was deputy chief gave me some jobs that turned out to be reasonably satisfying. For example I worked with the personnel office on reclassifying Carl Ostrom into a supergrade job. The effect was successful and brought all WO research staff directors into supergrade positions. Carl Ostrom's promotion was a labor of love because I had very warm regard for him and still do. The mensuration branch chief's job was only a small part of my WO work. I became involved in the International Biological Program (IBP), which came out of the National Science Foundation as I recall. It turned out the IBP was an important program for the Forest Service, including the Pacific Northwest Station. I'll come back to that again.

HKS: Is that when they rated or evaluated government research, is that what you're talking about? The quality of research?

REB: No, it was an effort on the part of those involved in the more basic sciences, the National Science Foundation and others, to address natural resource issues internationally and more comprehensively than we were doing with our narrowly focused research. The reason I mention that is IPB was a major supporter of three watersheds, Coweeta, Hubbard Brook, and H. J. Andrews, and that had a lot to do with the influence of those experimental forests in later policy issues.

HKS: I didn't realize that H. J. Andrews was one of three; I thought there were dozens...

REB: There were eighty-four in 1992 under Forest Service jurisdiction, but the three that I named have had an unusually strong impact on ecological research. The scientists who led those programs are major shakers and movers in policy issues today. Let's save H. J. Andrews until we come to my time at the PNW Station. It is an outstanding experimental forest. I had another job in the WO concerning natural areas. I was chairman of an interagency committee monitored by the Office of Science and Technology (OST), concerning natural areas. I presented some ideas that said that we ought to set aside still more examples of all the natural environments on Federal lands. These suggestions were not original with me; I was building on the old SAF program called Natural Areas. But the Forest Service was also an active participant in the SAF natural areas program and had a series of natural areas all over the country. We were trying to be sure that we had examples of all natural forest and range ecosystems. I also became chairman of the SAF Natural Areas Committee while I was in Washington. The natural areas in the Society of American Foresters, and various names by other public agencies and professional societies is, in my estimation, a very important program that's little understood. It deserves a lot more attention and support.

HKS: We have the SAF records in our archives; there's a big chunk on natural areas. What is in those records?

REB: I don't know what's in the SAF records, but I know what is in the field.

HKS: Okay, let's consider the field.

REB: There are now 250 natural areas in the Forest Service system, prime examples of naturally functioning ecosystems, and in my estimation a tremendously important adjunct to the preservation of biological diversity.

HKS: It strikes that they're very practical these days. Almost more valuable than they were when they were set up.

REB: Yes. I became involved in natural areas in Washington, D.C. from a national perspective, and then when I went to the Pacific Northwest, it gave me an opportunity to work, particularly with Jerry Franklin, on greatly accelerating a program on natural areas here in the Northwest. And maybe we can talk about that a bit more when we come to the PNW.

HKS: That will be good.

REB: Not original with me, the earliest natural areas go back to 1927, in fact there's a major one at Wind River, if you have ever been on the Wind River Experimental Forest.

HKS: Oh I have, yes.

REB: It's now called the Thornton Munger Research Natural Area, emphasizing the Douglas-fir ecosystem. But there must be a hundred natural areas in the Pacific Northwest, counting those on all ownerships.

HKS: Some of the rational for the establishment of wilderness and their uses in the '20s and '30s was...

REB: Research.

HKS: ...research. To set aside these benchmarks.

REB: Wilderness areas only served part of that purpose. One of my arguments in Washington, D.C. was to create natural areas within a wilderness. The feeling was, from the National Forest System, no, we don't want anymore classifications within wilderness, but finally I talked to Larry Neff, who was the deputy director of recreation. Larry signed a policy statement that said yes we can create natural areas within wilderness. What this meant is that we wouldn't build a campground or a trail through the natural area; they had to have some additional protection from human interference. Wilderness areas have been important for research, but I have the impression more sociological research rather than biological studies. Also we need to recognize that wilderness tends to represent only a portion of natural ecosystems, generally the high elevation or otherwise attractive scenic areas. We're back to the Washington office. Natural areas, IPB, zero-based budgeting. I have... Zero-Base Budgeting

HKS: It was Kennedy or McNamara...

REB: Zero-base budgeting was McNamara and it was called PPBS. Lyndon Johnson apparently was so taken with McNamara and his work at the Department of Defense having to do with zero-base budgeting, called PPBS (Program Planning and Budgeting Systems) that he wanted all agencies of government to use it. That part of research budgeting became another one of my assignments. I worked with several economists including John Fedkiw and Bob Marty. I entered

into the task with great enthusiasm, because it seemed so sensible to develop an analytic procedure to weigh various research alternatives. I left that exercise thoroughly disenchanted, because it was extremely demanding of data, extremely sensitive to assumptions, and in the end not used at all by administrators. One of the lessons that came out of the old PPBS work for me was that incremental changes are very much more realistic in government than is a zero-based review.

HKS: How do you do zero-based budgeting philosophically when you're dealing with the concept of applied research and basic research? I mean that's just sort of...

REB: You can't do it. When you think about it, budgets are invariably presented in incremental terms. If you've ever looked at a Forest Service budget, it gives the base year and it displays departures from the base year. In any event, I was so disenchanted with that PPBS system that it took me several years to develop any enthusiasm for another look at an analytic as contrasted to an incremental approach to research budgeting. But we did come back to it, and I think with some positive outcomes. But I'd like to reserve that discussion until we come to my second Washington office tour.

HKS: Theoretically you're in timber management research still.

REB: Yes.

HKS: But obviously you're experiencing much more.

REB: I was beginning to move off in other directions. I don't remember whether it was because I displayed some interest in other activities or somebody was pushing me in that direction. I certainly was underemployed as branch chief for mensuration. By the way the Branch of Mensuration folded when I left that job. I also served as assistant director to Ostrom; when he was gone I assumed some of the leadership in timber management research. I became more comfortable with the Washington office as time passed. My second year was a lot more pleasant than the first. My third year was also stimulating and pleasant, but a certain repetition was beginning to show up, because the work is, as I mentioned, geared to the annual rhythms of Congress and the White House. The Harvard Year

REB: I had always had a goal, that at an opportune time I was going to do the equivalent of a sabbatical. I wanted to reinforce my skills for whatever the next job was to be. If I had continued to be an active scientist I would have sought training related to my next generation of research. But I was already heavily involved in research administration, so I chose to spend a year studying public administration. I received an okay from Carl Ostrom, Dickerman, and others. And I was awarded a Bullard Fellowship at Harvard that paid my tuition. The Government Employees Training Act covered other costs. The Forest Service paid my salary. I spent 1968-1969 at Harvard. I left our family in Washington but came back about once a month. It was an arduous but productive year.

HKS: Max went through that program.

REB: Yes he did. You can choose almost any combination of things--early, mid or late-career, just almost anything. Intellectually it was the richest academic environment I've ever experienced. The Lyndon B. Johnson crew was coming back and the Richard Nixon appointees were leaving. The people who were departing included Henry Kissinger and Patrick Moynihan. At the moment I don't recall the names of all those returning. But, the J. F. Kennedy School was rich in faculty that had served in senior government positions. I had an option, I could spend a year there in residence with or without a degree. I chose to go for a degree. So I earned a second master's degree. It turned out to be a useful and valuable experience. Some courses were lousy but the ones that were good were super good.

HKS: What kind of classmates did you have? I mean were they like you or private sector or what were they?

REB: They were mainly from public agencies, two or three from Soil Conservation Service, a number from the military and Department of Defense and from other agencies in government. Yes, and there were several from state and local governments and there may have been a few who came out of the private sector. One or two of the officers were thoroughly disenchanted with the Vietnam war. I suppose my class had fifty or sixty people. Courses that were most useful to me had to do with economics and congressional and executive supervision of public policy. Arthur Maass was an instructor on congressional supervision of public policy. Despite my concerns about his role in *Muddy Waters*, his teaching was among the most useful.

HKS: You observed that this was really very significant, congressional oversight, and so when you went to Harvard you had this in mind. This is something you really wanted to understand better, the role of Congress in the way the Forest Service functions.

REB: Yes. I knew that before I went there because I knew that Russell, Stennis, and Byrd were influential, but I never understood some of the more subtle relationships. I might have discovered this all by myself but the year at Harvard really helped. And a person like Richard Nuestadt who wrote *The Power of the President*, a classical book that came out of the Kennedy years. He talked about the White House, how the White House sees the various departments and bureaus of government. It was most helpful to see the Forest Service and other agencies from vantage points of those who created policy. So it was a rich year. I also took a course in science and public policy, and it was at that juncture that I chose to look into the origins of Forest Service research. That gave rise to that...

HKS: History paper on origins of research policy...

REB: Yes, an unpublished paper titled "Evolution of a Science Policy in the Forest Service." There are some errors in the paper, but it served me well at that time and in the intervening years.

HKS: When you wrote that you obviously learned something, you learned some details and some cause and effect and some specifics. Were there any surprises? Or was it you just understood better what...

REB: Both. I understood very much better. Yes there were some surprises too. I came to realize how important Earle Clapp was to the origins of the Forest Service research. Earle Clapp's role in research is not well understood. He was influential in research in the pre-World War II period as Les Harper was in the post-World War II period. If you skim that paper, you'll also see that I recount some things that happened in the Harper/Jemison period that did so much to enhance the quality of the research in the Forest Service. There were no blinding revelations, but the insights were very useful to me in later years. And the preparation of that paper then permitted me to begin a dialogue with some people like Les Harper and George Jemison and Dickerman, and others and you've seen some of those letters that I've exchanged with them. Staff Assistant to the Deputy Chief ®FL¯ Harvard, 1968-1969, I've never worked harder in my life. Marie was back in Washington with our four youngsters and I would come back about once a month. By then there was a looming question as to what job I would have when I came back to Washington. When I left I was anticipating coming back to the Division of Timber Management Research. But in that period, 1968-1969, George Jemison retired for family reasons. He came to this school, the College of Forestry at Oregon State University. But the point here is that changes were taking place. Keith Arnold was recruited to the deputy chief job from the University of Michigan. He went to Michigan as the dean of the School of Natural Resources about two years earlier and was invited to return to the Forest Service to head the research branch. Dickerman would have been a very strong candidate to be the next deputy chief of research, but his wife Marge was seriously ill with what became a terminal illness, I think Parkinson's disease. Dick, I'm told, declined to be

candidate but continued as associate deputy chief. So Arnold returned to the Forest Service in 1969. Keith previously was the director of the Pacific Southwest Station and later director of Forest Protection Research in the Washington office.

HKS: I knew him then because I was in fire research in PNW. I knew him vaguely, I mean he was the big guy way up at the top.

REB: I got to know all of the WO staff directors fairly well, and Keith was one of them. In any event, Keith went to Ann Arbor to become dean of the School of Natural Resources. Keith did his Ph.D. work at Michigan, as I recall.

HKS: Was that right?

REB: He doesn't get very high marks from Michigan alumni because he dismantled that school and put it back together, from a hard science and professional school that Sam Dana, Spurr, Davis, Gregory, Graham, and others put together. The school became swept up in the environmental movement. So at least some of the older alumni think that he took it from a hard, discipline-oriented program into some fuzzy environmental stuff. However, Michigan was in serious trouble at that time with three forestry schools in the state and a rapidly changing environment for forestry. Duke and Yale went through some of the same travail during those years.

HKS: So he got them more into policy rather than...

REB: I'm not sure it was hard policy or soft policy. Keith changed the School of Natural Resources at the University of Michigan. He was a shaker and a mover and an innovative guy. I liked working for him, but he needed a Dickerman or an Ostrom or a Herb Storey around him to discipline and challenge that wide-ranging mind, and I mean that in a very positive way. In any event, Keith Arnold came back after two years in Michigan to serve as deputy chief. Someone decided that I should come into Keith Arnold's office as a staff assistant responsible for budget. That's where I came back after Harvard. This was one of Harper's innovations--the position of staff assistants to the deputy chief. These are people who do things like budgets, personnel matters, and program formulation for the deputy area. I think an organizational expert would look at a chart and ask why the hell do you need all of those positions? The important things about them were that they were training slots for the next job. If you look at some of those staff assistants you'll see the leadership of the Forest Service. It started in Research and was later adopted by other deputy chief areas. John McGuire, Tom Nelson, John Barber, Bob McCulley, Bob Callaham, Roger Bay, and many other leaders were at one time or another staff assistants in research. Those were so valuable as training slots that the pick of the litter went through them. Again, important for what you did but equally important as a precursor for the next assignment. I moved into the budget slot. I must have done two or three things really well in that job. Perhaps I could illustrate with a couple of anecdotes.

HKS: Good.

REB: About what you look for in leadership, people who occupy those positions, because this is exactly what I looked for when I occupied the deputy chief's job several years later. I got a phone call from the administrative assistant to Senator Hiram Fong of Hawaii. Senator Fong was on the Interior Appropriations Committee chaired by Senator Alan Bible. His assistant was Earl Nishamura. He said, my senator is running for reelection in Hawaii, and he helped to get an appropriation of $100 or $150 thousand for your research laboratory in Hawaii. He would like to know what was accomplished with those dollars. I said I'll get the information for you. Before Nishamura hung up, however, I asked "Is there any possibility that the senator might like to accelerate the programs in Hawaii?" I assured him that we were doing good research. He said, you know I hadn't thought about that, I'll ask the senator. He called back and said yes the senator would consider another increment to the funding. I said, okay, when I report to you on what we've

already done, maybe I could give you some suggestions about what the new programs might be. So Nishamura and I worked on a set of questions that Fong would ask the Forest Service during appropriations hearings. Both he and Fong were really naive about this sort of thing. Alan Bible was chairing the appropriations hearings when Fong and Nishamura arrived late. Of course Keith Arnold had all of the questions and all of the answers, and he knew Hawaii from his Pacific Southwest days. When Fong came in I signaled to Nishamura. We talked on the side and I said, suggest to Senator Fong that he ask Senator Bible to yield. Fong then went through the set of questions. He held a press conference right afterwards. Keith went to the press conference and talked about all the things that the Forest Service was doing in Hawaii. One of the things that Keith did, though, was talk about the importance of timber in Hawaii. The then current issues in Hawaii weren't timber at all, they were about the environment. I tried to get Keith to steer away from the timber subject. In any event, Fong added another $150 to $200 thousand to the Hawaiian budget of the Pacific Southwest Station. It all came because of that chance phone call from Senator Fong's assistant.

HKS: The introduction of exotic species was and still is a serious problem. Is that one of those environmental issues?

REB: Yes, and decline of the native forests called Ohia decline. Those were the things that I suggested to Keith that he talk about not the need to grow more exotic timber. In any event the press conference worked fine. The point that I'm making here is the opportunistic nature of that unstructured, fast moving environment. I responded in a way that got a couple of hundred thousand dollars out to Hawaii, and I'm sure that didn't escape Arnold or Dickerman. Let me give you one other example.

HKS: All right.

REB: The laboratory construction program was in full swing in those days, in the very late '60s and the early '70s, still a carry over from earlier years. There were two laboratories under consideration in the Northeastern Station, one in Burlington, Vermont, where Senator George Aiken was the benefactor. And, the other was at Durham, New Hampshire, and I can't remember the name of the senator. But Warren Doolittle was the Northeastern Station director. He was preceded by Dick Lane, who was a very aggressive guy. They'd been working on getting those two laboratories. Warren said he was going to pay a visit to the Hill. He asked what were the Washington office priorities. Warren wanted to be in step with the Washington office, and I told him what Keith and Dick Dickerman thought--that Durham, New Hampshire, was the most important and that Burlington, Vermont, was second. As I reflected later, my response was accurate but not astute. Warren paid a visit to Senator Aiken and told him that Burlington, Vermont, was the Forest Service's number two priority for funding after Durham, New Hampshire. George Aiken just exploded. It is important to know that Aiken and Richard McArdle were good friends. Ed Cliff was then the chief, and George Aiken got all over Ed Cliff and Warren Doolittle. If I had been more perceptive I would have anticipated that conflict. In any event, George Aiken arranged the money for the Burlington lab even though he wasn't on the Appropriations Committee. He had so much influence in the Senate that he could easily do it.

HKS: And that lab went on the campus.

REB: Yes. It's now called the George Aiken Laboratory on the campus of the University of Vermont. Durham, which was our number one priority, was also funded.

HKS: How did you get the ranking of the laboratories, the timber species are very similar.

REB: The rankings are based much more on physical need, such as office and laboratory space and what Keith and Dick perceived to be political realities.

HKS: The quality of the forestry schools or the faculty at that moment.

REB: No, both forestry schools were important and of course the Forest Service wanted both laboratories. But there were other political realities, budget constraints, and other things that were the major determinates about which was first or second. Let's go to the Durham lab after the Doolittle visit. The administrative assistant for the New Hampshire senator called and said my senator has agreed to support the Durham lab in the appropriations but he can only get one million dollars. I knew enough about the design of the Durham lab to know that we could construct only about half the building for a million dollars. It was a two million dollar job, it was a square building and you just couldn't build half of it. I said that the design doesn't lend itself to partial construction. And she understood what I said and she called me back an hour or so later and said my senator has agreed to go for all the funding. The point that I'm making here is that there are all kinds of junctures and opportunities to advance an agency's program, and those were two, Hawaii and New Hampshire/Vermont that I remember vividly. Please understand that it took other participants--the station director, the deputy and associate deputy chief, for example--to make the action complete.

HKS: But also you have to have this environment that you were authorized to broker a deal in response to an opportunity without checking back with the boss, because you don't have time.

REB: Well, I knew...

HKS: But you knew it was going to be okay. There is a certain unstated delegation of authority to go ahead and go for it when an opportunity presents itself. The Chief/Deputy Chief Office

REB: That's part of the unstructured nature of the Washington office. Now with that kind of delegation of authority there are also chances to make some fairly substantial mistakes.

HKS: A mistake can be something that didn't turn out okay.

REB: That's right.

HKS: If it turned out okay then it was smart.

REB: Those were a couple of examples, and I'm just guessing what supervisors were looking for. Certainly it was a quality that I was looking for in my later years--the capacity to take risks, but with reasonable judgment. Dick Dickerman and Keith Arnold were interesting people to work for. And Dick was another one of these mentors that meant so much to me through the years, another great developer of people. Arnold was the deputy chief and Dickerman was associate deputy chief. Keith Arnold was a swinger, and I don't mean that in a pejorative way, a person with a wide ranging imagination, spinning off ideas but sometimes not screening them very well. Dick was much more deliberate but also imaginative and impressive in his own quiet way. I was working with Keith, who was bouncing off ideas all the time, but I would also work with Dickerman. I had easy access to both of them because of that budget position. Dick, always very loyal and supportive of Keith, would tell me, you know we don't do things the way we did when Jemison was here. [laughter] And, I damned well knew it. Keith really was an imaginative guy, but my assessment is that he also needed somebody like a Dickerman and two or three other people around him who would caution him from time to time.

HKS: Ed Cliff, in terms of the folklore of the Forest Service, ran a pretty damn tight ship. Why would he have selected Keith Arnold? It strikes me as inconsistent, where you have sort of a free agent. The way you characterize Keith doesn't fit the stereotype of Ed wanting to keep the lid on or making sure that what happened is what he wanted to happen.

REB: I don't know the answer to that question; it's a good one. I had the impression that Ed was more innovative than that, and more willing to take chances than you might have suggested. If you look at Ed Cliff, open flannel shirt, crusty, probably more development than environmentally-

oriented. John McGuire, more intellectual, more urbane, an entirely different demeanor. I'm sure that Ed Cliff had a lot to do with bringing John McGuire in. McGuire came in as deputy for programs and legislation followed by associate chief, then chief. I think Ed deserves a lot more credit for tolerating different points of view, in fact encouraging different points of view than he might get traditionally.

HKS: Others in the Washington office at that time have commented that at chief and staff, Ed would make a series of announcements and then walk out. That may have been a perception of someone who didn't like what was going on.

REB: That could be although I wasn't aware of his early departures from confrontation. I was a staff assistant, and I sat in on some of those meetings. Boy, if you ever wanted to see a smoke-polluted environment it was an Ed Cliff staff meeting.

HKS: With his pipe going.

REB: Oh, it was just incredible. [laughter] My relations with Ed were more distant, but I thought that he especially appreciated his science arm. Have you encountered the Byrd hearings, the Saturday appropriations hearings about the Monongahela case?

HKS: No, I've heard a little bit about the Monongahela stuff, which we can certainly talk about.

REB: Well it's not germane to this central topic, but Senator Byrd was fronting for Senator Jennings, both of West Virginia. Randolph was deeply involved in the Monongahela situation. Ed Cliff was still chief, and the Forest Service was unwilling to change some silviculture practices. I'm sure it had to do with even-age versus all-age management and especially clearcutting. Senator Robert Byrd was chairman of the Appropriations Sub-committee, and he was very forceful; he's strong in his own right concerning the Forest Services appropriations, especially those concerning West Virginia. He was holding the budget hearings and Jennings Randolph was trying to get to him to perform some oversight functions about the Monongahela. Byrd said that he wanted to hold Saturday hearings on the issue. Jennings Randolph was in the room during the entire hearings, but he's not nearly as swift as Byrd, so Byrd brought in about six or eight witnesses from West Virginia, and all of them were absolutely opposed to the Forest Service timber harvesting activities on the Monongahela. Only one person was sympathetic and that was Dr. White, then head of the forestry school at Morgantown. Byrd spent the whole Saturday badgering Ed Cliff, much of it for public consumption in West Virginia, about the Monongahela. Ed Cliff was accompanied by Carl Ostrom and two or three other scientists. This is one of the reasons that I say that Ed had high regard for his science group. He was staunchly defending the science behind the silviculture used on the Monongahela. I was sitting behind Ed, and I could see him getting red and really upset. There was much posturing on the part of Byrd, as nearly as I could tell, on behalf of Jennings Randolph. It was one of the most significant days for me in Washington. After the hearing, Ed mentioned to a couple of us, that shortly thereafter he visited with Byrd. According to Ed, Byrd said, "No hard feelings, Ed, what do you need in the budget next year?" This does illustrate a little bit about my perception of Ed. Ed Cliff had been chief for upwards of ten years at that time. My impression was that Ed represented a different era, and it was time for change. I've always admired the change that took place. McGuire would never have come in if Ed hadn't supported it. And John McGuire brought an entirely different personality and a different perspective to the job of chief. I thought he was just the right person for the time.

HKS: Did John ever tell you the story about how he got to be chief?

REB: No.

HKS: Ed never talked to him at anytime about being chief?

REB: No.

HKS: It's in his interview, and John has a good sense of humor and he portrayed it as really kind of a silly operation. Here he was working away and he looked around and he said you know, I might be chief one of these days. But Ed had never talked to him about it at all.

REB: He was just right. His sense of humor and his intellect were an interesting contrast to Ed's. But I thought a great deal of Ed Cliff too who also had broad interests, and an incredible recall capacity.

HKS: I've got a question here that may fit into your chronology.

REB: Go ahead. Research Planning

HKS: This is from your Harvard paper. In 1962 Jemison was assigned full time to prepare the ten-year research plan published in 1964. You went through your stuff and you picked this out and you brought it in as something that you wanted to refer to. *A National Forestry Research Program* published in May 1964, how is something like this significant? What do these kinds of reports mean to the way research transpires? He looks ahead to the year 2000. We can really track the accuracy of the forecast now. We're almost to the year 2000.

REB: I want to sleep on that question.

HKS: Okay, we'll come back to that.

REB: I want to pick up one point that goes back to the Harper/Jemison period. Now this program for research, if my memory serves me correctly, was really a Richard McArdle exercise. McArdle was trying to strengthen the program for the national forests, and he needed to display to the Congress that he had a well thought-out plan. That really was the basic purpose. A program developed about three or four years before was called Program for the National Forests, or something like that. In any event, that Program for the National Forests did outline what they needed. There was one paragraph in it saying that there was also a program for research. Harper had in his hip pocket a very much abbreviated plan about where he wanted research to go. It was that plan that Harper was using to build the research program of the Forest Service in the late '50s and early '60s. It was only a one paragraph entry. I'm sure that Jemison was assigned the job of fleshing that plan out. The irony about that situation is that most of Harper's accomplishments were made before the formal plan of 1964 came out. Harper doubled or tripled the research budget of the Forest Service in those years. And Jemison also built an accompanying construction program. I don't know whether construction is mentioned or not but that had a lot to do with new laboratories. Organizational Changes in Research

HKS: Were you making a lot of trips out into the field when you were doing budgets, did you do a lot of travel to places?

REB: Not very much as staff assistant. I did more of it when I worked for Ostrom from 1965-1968. That brings me to the next event. I was in my second year with Arnold and Dickerman. A major research review was planned in 1970 for the Pacific Northwest Station. Dickerman led the review team, including visits to Oregon, Washington, and Alaska. Because of budget activities in Washington I couldn't be in on parts of the Oregon and Washington review but I was on the Alaskan part. Bob Harris, then an assistant director of PNW, was also there. I welcomed the opportunity to get out of the Washington office and to see Alaska. With a bit of hindsight I recognized that this review was a prelude to a whole series of major retirements. In essence it was the recruitment of the late 1920s and the 1930s that were retiring including Phil Briegleb, director of PNW; Joe Pehanec, director of Intermountain Station; Charlie Connaughton, and many others. The post-World War II age class was coming in.

HKS: Sure.

REB: On June 1, 1971, Charlie Connaughton and Phil Briegleb retired. I was named director of the Pacific Northwest Station. Bob Harris was named the director of the Intermountain Station, because his predecessor, Joe Pehanec retired. There was a whole series of changes. Rex Resler became regional forester of R-6 on that very same day. In many respects the late '60s and early '70s were the transition from pre-World War II to the post-World War II leadership. I became the director of the Pacific Northwest Station after six years of a variety of assignments in Washington.

HKS: Anything else you want to talk about the staff assistant era, work on budgets and so forth? I mean there were a lot of things going on. Les spent a lot of time in his interview talking about the administrative structure, the Man-on-the-Job program. Were you involved in that kind of business?

REB: No, those were all done before I got there. Harper retired a few months after I came to the Washington office in 1965. Harper was surely the most influential person affecting Forest Service Research in the post-World War II period.

HKS: How about the reorganization of the stations?

REB: I was involved in three significant organizational changes during my years with Forest Service Research. The first were those Harper initiated in the mid and late 1950s. At that time, Forest Service Research went from division chiefs generally with unidisciplinary portfolios to assistant directors with a number of projects involving several disciplines. The second was really an Arnold/Dickerman innovation. I was confronted with that as soon as I came to the Pacific Northwest Station. The third was also an Arnold/Dickerman innovation, but had to do with organizational concepts to do team research. But first, are there other questions about the Washington office? Pioneer Units KS: How about pioneer scientists. That strikes me as a very profound innovation.

REB: That's another change borrowed from the Agricultural Research Service, and Harper bought into it. The concept was sound but the implementation was difficult.

HKS: So you weren't involved in the creation?

REB: No, but I was involved in the pioneering research questions later as deputy chief. The concept was to take the most productive, creative, and imaginative scientists and set them up in separate units where they would receive essentially no supervision. The pay would be determined by the Person-in-Job provisions, but would be high level. The first pioneering scientist in the Forest Service was Lou Grosenbaugh, who was the inventor of 3P sampling or Probability Proportional to Prediction sampling. Phil Larson at Rhinelander, Wisconsin, was another. A great idea. ARS became disenchanted with the concept in later years, and I did too, because one would build a team of scientists and technicians around a pioneering researcher. The problems occurred when the pioneering scientist moved on or retired. What do you do with the laboratory and the people built around that scientist? We tried to create that kind of environment in other ways but with a little less formality and more flexibility. I think maybe we accomplished that. Conceptually, the pioneering scientist was a good idea, but operationally it was difficult to use.

HKS: Who's the senator that gave the Golden Fleece award?

REB: That was Senator Proxmire of Wisconsin. I view the Golden Fleece award as a mixed bag--some legitimate issues, some that were phony and unfair. It's a price one paid for government service. None came to Forest Service Research during my time.

HKS: I could see Proxmire really tearing into that. Seven million dollars to study something, and he'd describe how silly this is. But it didn't suffer at the hands of Congress, apparently. Congress put up the money.

REB: Scientists and administrators have a capacity for self-inflicted wounds--pompous and exotic titles for grant proposals, and subject matter difficult for the public to relate to. Society needs a Senator Proxmire, but not too many. Back to the Pacific Northwest Station. I came here on June 1st, 1971 and departed almost exactly four years to the day to return to Washington. One of the most important things confronting the PNW Station was internal reorganization. This was a Keith Arnold innovation. Keith wanted to decentralize research administration and increase technology transfer. That meant that assistant directors would be stationed at field locations when it was logical. He also was responding to a General Accounting Office (GAO) study of a year or two earlier having to do with technology transfer. The GAO study was critical of how some of the findings of Forest Service Research were used. The GAO based its criticism on ten case histories. The GAO report said (for example) you did all this research on crop tree release and nobody is using it.

HKS: What kind of people do the studies for GAO?

REB: Ambitious young people who get no rewards out of saying that something is okay.

HKS: What are their skills? Are they trained as scientists?

REB: Generally not. They come from a variety of backgrounds such as law, economics, and political science, but relatively few from science. The GAO report was seriously flawed in many respects, but it touched on an underlying issue about getting scientific findings into practice. That was and is an important issue. So, in order to address that question, part of the Arnold organization created in the experiment stations the position of planning and applications assistant director. You've got three things--creation of deputy director and application assistant director and the moving of assistant directors to field locations with interdisciplinary portfolios. The Pacific Northwest Station hadn't adopted that scheme when I came here. The Pacific Northwest Station

HKS: You succeeded who at the station?

REB: Phil Briegleb.

HKS: I knew Phil. He was the director there when I was there.

REB: Reorganization was right here in front of me. Dick Dickerman came out and simply told me in his quiet way to implement this organization. It didn't fit the Pacific Northwest Station very well, but we did it. Bob Tarrant became deputy director, headquartered in Portland. We moved Bob Romancier to Corvallis, which was our largest field location. But, it just didn't fit well to move either of the other two assistant directors, Ken Wright or Don Flora, away from station headquarters although we seriously considered moving Ken Wright to Alaska. George Garrison, who was then at Le Grande, became the planning and applications AD in Portland. The impacts for us were not all that great. Nationwide, I think, the most important thing was that it put emphasis on technology transfer, mobilizing research information so that it was more useful. Other aspects of this reorganization, such as field location of ADs, didn't work as well, although the basic concept is still in place at some stations. Technology Transfer

HKS: Isn't the other half of the equation the quality of staff over in the regional office? They have to absorb and transmit. How do you affect the technical quality of those people? Most of them really weren't trained as specialists, to be honest.

REB: It certainly is a shared responsibility among scientists and users. However, as a generalization, research was expected to be far more active and aggressive at conveying technology to the users. The emphasis on technology transfer was appropriate for that time, and it's appropriate yet today. The tools for technology transfer are many. Personalities also come into play. One of the most effective forms of technology transfer, reinforced in my mind since I've

been here at Oregon State, is continuing education. This college must have twenty-five or thirty workshops a year for mid-career training. Some are one day long; some six weeks long. That's where technology can be mobilized appropriately and conveyed in large bunches to people who just don't have time to read a publication or listen to a talk when they're on their regular job.

HKS: So the Forest Service would authorize or direct staff people to attend these courses?

REB: Yes.

HKS: That's the mechanism by which they are updated from time to time.

REB: Yes. Continuing education is one of the most effective forms of technology transfer that I've ever seen. Of course, there are others. An additional comment: the P&A AD's job was also becoming important to handle the planning requirements of RPA. That was the Arnold organization. Dick Dickerman in some of his personal remarks to me has said this wasn't popular with the stations. Dick may have been talking about me because I didn't display much enthusiasm. But it really worked okay, and was an organizational innovation in the Keith Arnold style. Reorganization

HKS: Is this an extension of the Person-in-Job?

REB: No. It was a principal response to that GAO report on technology transfer, and also a need to get top level station administration closer to the field and to the problems. Now, let me comment a little further on that aspect of the job. With that reorganization, assistant directors were moved away from station headquarters in many places in the country. For example, Riverside, California in the Pacific Southwest Station. The Northeastern Station put its assistant director at three field locations, Delaware, Ohio, Morgantown, West Virginia, and Durham, New Hampshire. The Intermountain Station positioned an assistant director at Missoula, Montana. It put the stations in better contact with client groups. It was important to have an administrator in the field. That decentralized organization was in place when I came back to Washington as deputy chief. It was a mixed bag right from the start. Some of the station directors were complaining. They wanted to pull their AD's back to station headquarters where they could work with them on a day-to-day basis. Gradually they began to pull back the AD's to station headquarters. I think now essentially all of the stations have brought their AD's back. In later years, especially after 1980, increasingly tight budgets also caused streamlining of this organization.

HKS: Are all the stations generally the same?

REB: In principle but not in detail. There are some broad policy guides such as Person-in-Job, research reporting, budget formulation, and overall station organization that are standard, but every station has a personality and an environment of its own. Here research content, relations with cooperators and user groups, historical development of forestry and research, land ownership patterns--all affect the individual station. This is as it should be in a decentralized organization. The Forest Products Laboratory, as I recall, was last to adopt the overall organization of the eight regional stations. In fact, up to and including some of the Harper years, FPL tended to play a highly independent role from the remainder of Forest Service Research. Interchanges among stations and FPL by such leaders as Bob Youngs, Bob E. Thington, and John Erickson helped. Today, in my estimation, FPL enjoys close working relationships with stations but still works closely with its traditional constituents in the forest industries.

HKS: I suppose there's less transferring in research, so people are there for a long time, as opposed to National Forest Administration; if you're successful, you're moving around.

REB: That's right. National forest systems have a hierarchical career ladder--district ranger to supervisor's office then on to the regional and Washington office. Research has a dual track.

They have the Person-in-Job concept, that is, a scientist can stay in place and still be promoted depending on the quality of research they do. Or, they can move into an administrative position. It complicates life a little bit in research. It permits scientists to spend their career at one location. However, there is much more emphasis on mobility for those who choose research administration.

HKS: I'm interviewing, probably in December, Frank Wadsworth who has been in that position since 1942. He may be unique, but that's a long time.

REB: Frank is a special case. One of the longest serving scientists, and one who has world recognition as a tropical silviculturist.

HKS: I am trying to understand the various kinds of management reorganizations like the Person-in-Job and the creation of assistant directors and all the rest. It's all part of a change in the way research is structured. There wasn't a master plan that in ten years we'll have implemented these things. Each new deputy chief came along and turned the ratchet another notch on reorganization. The stations must have been involved and reacted under Nixon and under Carter to reorganize the Forest Service.

REB: I said that there were three internal research reorganizations during my time in the Forest Service. The first one was Harper's, the second one was Arnold/Dickerman, and the third one, which had to do with new mechanisms for conducting team and larger scale occurred research, also in the Arnold/Dickerman period. I'll talk about the third organizational change later. In addition to internal reorganization there were external organizational questions, of course, that did or would have affected research. The Eisenhower consolidation of stations and regions, the ten standard regions proposed in the Nixon era, and Jimmy Carter's failed efforts to create a department of natural resources. These were external to research, and while they had an impact on research in the end, they didn't influence it very much. Station Budget Techniques

HKS: Alright, you're in Portland. You've reorganized the station.

REB: I want to make a comment on the station that I inherited. Phil Briegleb was a long-term station director. He'd been at Central States Station, then at the Southern Station, and he came to the Pacific Northwest as station director about 1960. He spent at least half his career as a station director. Phil was, in my estimation, among if not the most capable fund raiser of any of the station directors. In all three stations, there were substantial increases in funding after he arrived.

HKS: Is that right?

REB: ...with members of Congress and other key cooperators.

HKS: You don't ever deal with OMB or that side of the budget?

REB: Oh, yes! But Congress has had more influence on the budgets and the programs of the research branch of the Forest Service than does the administration, including OMB, ever did.

HKS: So here he would have had Wayne Morse, is it too early for Hatfield?

REB: No. He had Wayne Morse, Mark Hatfield, Julia Butler Hansen, Wendell Wyatt, and Al Ullman, who was chairman of the Ways and Means Committee and was very influential.

HKS: Scoop Jackson.

REB: Scoop Jackson was never much of a supporter of the Forest Service or Forest Service Research. Neither he nor Maggie Magnusson, both powerful senators from Washington, displayed much interest.

HKS: Is that right?

REB: The Pacific Northwest also always had somebody on the Appropriations Committee in the House--Julia Butler Hansen, Wendell Wyatt, Bob Duncan, Norm Dicks, and Les AuCoin. In terms of research, it is the Appropriations Committees that really makes funding decisions. On the Senate side, there were people like Wayne Morse and Mark Hatfield that influenced appropriations. By and large, congressional appropriations were influenced far more by the interests of individual members then by political party whether a senator or congressman. Station Personalities

REB: Phil Briegleb was a great fund raiser. However, he was viewed as an austere, distant, reserved guy by station people. That was an unfair characterization. Phil rarely visited individuals and wasn't comfortable dropping in on offices or with confrontation issues. Still Phil had his finger on the pulse of virtually every aspect of station life and left a strong station upon retirement. When he learned that I was going to be the director of the station, he arranged a joint visit to all key congressional contacts in Washington. Phil and I have stayed in contact ever since. He's writing his recollections of the PNW Station. Phil also had a top staff that was, in my estimation, one of the best in the country. It included Don Flora, Ken Wright, Bob Harris, and Chuck Peterson, solid performers all. Bob Tarrant and Bob Romancier joined the station staff soon after I became director. Bob Romancier took Dave Tackle's place and Bob Tarrant followed Bob Harris, also solid performers. Bob Tarrant became deputy director a year later.

HKS: I knew several of them from my days with the PNW Station.

REB: They were just marvelous people to work with, and several of them, Wright, Flora, and Tarrant had chances to move into supergrade positions. Flora wouldn't leave the Northwest.

HKS: He had his son and daughter in that ice skating business.

REB: That was before they became ice skaters, but he wouldn't or couldn't move. McGuire wanted him to succeed Joe Josephson as head of economics and forest inventory research.

HKS: Is that right?

REB: Ken Wright could have been the director of forest insect and disease research, also a supergrade position in Washington; family considerations intervened. Bob Tarrant did become director of the station when I left. The Pacific Northwest Station also had something else going for it. I knew this from my TMR days in Washington. It had a group of researchers who were shakers and movers, and you know some of them, Jerry Franklin with the H. J. Andrews Experiment Station

HKS: Yes.

REB: Jim Trappe is one of the world's authorities on mychorrizae.

HKS: Is he still here? Retired?

REB: He's retired, but has an adjunct appointment with OSU. Les Viereck's ecological work in Alaska. Jack Ward Thomas, who came in during my time, at Le Grand, Oregon. Val Carolin in insect research coauthored a book on insects of the West. Gary Daterman, Mauro Martignoni, and Hank Thompson for their Douglas-fir tussock moth research and there were several other outstanding researchers. But the point I'm attempting to make here is, perhaps serendipitously or

perhaps accidentally, there was just a great deal of ferment in this station and one wonders where the credits go for it.

HKS: It's as though we were talking about earlier in the Lakes States.

REB: Yes, but the Pacific Northwest Station had more than its share of shakers and movers. All stations, however, had and have centers of excellence.

HKS: Do you think the problems here are more exciting? That it attracts?

REB: All of that plus the fact it was a larger station than most. Of course there were average and less than average people, but with that kind of leadership you could place the people who weren't as able or weren't as aggressive under the shakers and the movers. We did a lot of that. So I inherited the station here that was, in my estimation, one of the most robust and healthy of any in the country. Phil Briegleb certainly deserves credit. Those three or four assistant directors who were here or came shortly after were among the most capable people that I've ever worked with. I've never lost sight of that.

HKS: So Bob Tarrant succeeded you?

REB: Yes.

HKS: This may be out of sequence. I know Bob as a very congenial guy, that's all. We had coffee together once in a while and he always had jokes to tell and that sort of thing.

REB: He's a good story teller.

HKS: But without sounding stuffy, by my knowledge of Bob, he didn't have a Ph.D.

REB: He did not.

HKS: Was that strange to make him director in this generation? You must have been involved in someway with grooming him or selecting him.

REB: Yes I did. Permit me to back up a bit. I had the Bob Harris vacancy here when I came. Did you know Walt Hopkins?

HKS: By name. He's recreation, right?

REB: He was recreation. Walt was a good friend in Washington, D.C. He was frustrated as hell with Washington, and when he learned that I was coming here he asked if he could be a candidate for the Bob Harris job. I talked it over with Dickerman and Arnold and they said yes, and in fact they were eager to have me take Walt. They didn't want the station to fill from within. Walt Hopkins came to visit the station but first he stopped to see that damn pirate Carl Stoltenberg, dean of the College of Forestry at OSU. Stoltenberg offered Walt a job to teach introductory forestry. Walt had already accepted my job, but changed his mind without telling and accepted the Stoltenberg one at OSU. That turned out to be one of the happiest circumstances both for Walt Hopkins and for the Pacific Northwest Station. Walt taught introduction to forestry and was a super teacher of young people. The faculty still talk about him. I think he was much better at teaching than research administration. In any event, Hopkins' retirement permitted me to ask Bob Tarrant to fill the Bob Harris vacancy. I'd heard many good things about Bob Tarrant. Bob was living here in Corvallis, and he accepted the job provided he could stay in Corvallis until his youngest daughter finished high school two years later.

HKS: He was assistant to George Meagher in timber management research when I was at the station, that's how I know Bob.

REB: Bob talked frequently about his work with Meagher. It was Bob Cowlin who encouraged Bob Tarrant to go to Corvallis and get away from station headquarters. So Bob came here. He had trained himself as a soil scientist. Bob intended to get a Ph.D., except that like me, he was recalled to the Korean War.

HKS: Oh.

REB: And by the time the war ended family responsibilities were heavy. He may not have had a master's degree, I don't know, but intellectually he was...

HKS: No question about that, but still...

REB: Bob was a capable person. He had that ability to work well with people. He was also a strong AD on external relations, especially political ones. He understood the Pacific Northwest; understood Washington, D.C. and he...

HKS: And certainly a very affable guy.

REB: Yes. Then he and Jean moved up to Portland after two years in Corvallis. Soon after Bob was appointed deputy director of the station. Bob Tarrant had the ability to handle external relations with great sensitivity and warmth. He was doing the jobs that I wasn't doing. By the way, one day somebody ought to comment on how I was perceived as station director.

HKS: In a sense deputy directors function like an associate chief?

REB: Yes.

HKS: Freed up the chief to do the chiefly job, but they run the organization on day-to-day basis.

REB: When it came my time to leave the station, I participated in the search for my successor. I was going back to the Washington office as associate deputy chief, and so was consulted about potential successors. I very much supported Bob, because I had so much confidence in his abilities. Bob was selected as station director and stayed in that job for four years. Bob would have been an even stronger director if he had previously had a tour in the Washington office in order to better understand that Byzantine world. Still with his quick mind and previous Forest Service and military experience he was well prepared for the job. Again the point I'm making is that I inherited a really solid program here. The Douglas-Fir Tussock Moth

REB: I want to discuss now two more things in the Pacific Northwest. One of them was the Douglas-fir tussock moth outbreak. The second was innovative organizational concepts to deal with the Douglas-fir tussock moth problem and other large-scale research programs. About the tussock moth. When I came to PNW a Douglas-fir tussock moth outbreak was brewing in eastern Oregon. Eight hundred thousand acres of forestland were threatened. DDT previously had been used effectively to control tussock moth outbreaks. This time there was a public outcry against using DDT. EPA, which had gained a great deal of authority in intervening years, would not grant authority to use DDT unless the Forest Service met some rather stringent conditions, including an accelerated research program that included alternatives to DDT. Ken Wright, Gary Daterman, Hank Thomas, Mauro Martignoni, and Boyd Wickman, who had been working on tussock moth research, were major players before the outbreak and even more important after. This brought about the third set of organizational changes internal to research, as I saw them. Keith Arnold and Dick Dickerman with strong assistance from others put together something called the combined Forest Pest R&D Program, commonly called the 3-Bug Program.

HKS: Right.

REB: Okay. There was some Machiavellian behavior here too on the part of the Forest Service. The focal point was Douglas-fir tussock moth and DDT, and the strong promise that there would be accelerated research funding to go with that Douglas-fir tussock moth program. But Dickerman and Arnold said, you know there are other major insect problems in the country too, why don't we piggyback them on the tussock moth program. And, that's where the 3-Bug came from, the second bug being gypsy moth in the Northeast and the third bug being the southern pine bark beetle. Bob Long was the assistant secretary in charge of the Forest Service at that time. And he, Ned Bailey of his office, and a long-time colleague Keith Shea...

HKS: I know the name. Did he work for Weyerhaeuser?

REB: Yes he did.

HKS: When I was on the senior field trip at the University of Washington we went on a tour and he was there. I always thought of him as a pathologist.

REB: He is a pathologist. Keith has a large capacity for organization of questions. I have an interview from him that I'll be glad to share with you.

HKS: Great.

REB: In any event, that group, Keith Arnold and Dickerman, Bob Long, Ned Bailey, and Keith Shea, put together an organizational concept, an RD&A concept to address problems associated with those three insect problems. Let us have tightly drawn plans, they said, let us bring together an appropriately large team to address the problem and provide milestones and markers and things of that sort. In addition to the Forest Service, Cooperative State Research Service, Agricultural Research Service, and Animal and Plant Inspection Service were partners in the program with additional funding allocated in the Forest Service budget. The 3-Bug Program was funded as I recall at about six million dollars per year, a large budget increase for forestry research by early 1970 standards.

HKS: RD&A, that's Research, Development and A?

REB: Application.

HKS: Application. Part of the technology transfer process.

REB: Yes, a research and development mechanism to bring together larger teams to solve more complex problems more quickly. My part in the scheme was as the station director administering the tussock moth program. In many respects, my role here was peripheral, because the strengths were in the scientists that I named earlier. But I think maybe my understanding of how the Washington office worked and what Keith and Dick were trying to do may have helped organizationally in bringing people and organizations together to solve a complex problem. And if Keith Shea had a special talent for organization in the Washington office, Ken Wright had that same skill in the PNW Station.

HKS: Ken Wright told me, it must have been the tussock moth, but it was so controversial that the secretary of agriculture created a special team, and Ken was pulled out of the station to serve as director of that team? It was some insect problem.

REB: Ken was selected to be the program manager in Portland for the tussock moth program.

HKS: Maybe I misunderstood what he was saying, but it was such a high level concern that to make sure that the Forest Service politics didn't get involved, the secretary's office actually handled this.

REB: Yes. The program was administered by the secretary's office under the direction of the assistant secretary, Bob Long. Keith Shea was transferred from the Forest Service to work as a staff officer reporting to Bob Long on that national program. Each of the three program managers and their immediate staff also were assigned to the Office of the Secretary, USDA. The overall policy direction came out of the secretary's office as well as approvals for annual plans and budgets. But as you can imagine the administration of it was decentralized even more. My job was to provide overall direction to the tussock moth program, but with people like Ken Wright and a few others around...

HKS: Is the tussock moth still an issue?

REB: Yes.

HKS: Would you say the research was effective?

REB: Yes.

HKS: How do you solve the problem then? I'm a member of Congress, I've been giving you all this money and we've still got the bug.

REB: There are two issues involved here. One of them is organization and the other one is scientific. These research, development and application programs had their start at that time. Administratively it's a model that we've copied a number of times since then. It was also a way to mobilize funding to achieve coordination and accountability. That was the organizational question. In terms of science, the Douglas-fir tussock moth program turned out to be far and away the most successful of any of the 3-Bug programs. The reasons were only partly related to the organization. There were two technological developments underway at the time of that outbreak, both of them here at the Forestry Sciences Laboratory. One of them was the work with a virus, nuclear polyhedrosis virus (NPV) by Mauro Martignoni and Hank Thomas. They knew that tussock moth outbreaks collapse because a naturally occurring NPV begins to sweep through the insect population. By then, however, the damage to the forest is already done. Those two scientists developed the techniques for reproducing the virus in the laboratory and testing its efficacy and safety. That technology was just beginning to emerge when the 1971 tussock moth outbreaks began. The second major scientific breakthrough came from Gary Daterman, a young scientist here at the time you were with Pacific Northwest Station.

HKS: I don't remember the name.

REB: Gary worked on the sex attractant for the Douglas-fir tussock moth in cooperation with the Oregon Graduate Center located on the west side of Portland, which had strong organic chemistry skills. It took several years to identify the sex attractant, pheromone, but the team finally was successful. That technology came to fruition about the same time that the outbreak began. So there were two major technologies to feed into that tussock moth RD&A program -- a way of detecting and monitoring the insect population, with sex attractant, and a means of controlling it with early insertion of the virus into the outbreak area. The RD&A programs tested both technologies and all the signals were positive. Boyd Wickman and his associates understood the ecology of the tussock moth and deserve a great deal of credit for the field testing. Then the epidemic collapsed. Ironically we haven't had a major outbreak in the U.S. since that time, but Canada has. And so the Pacific Northwest Station and Canada have collaborated on those two technologies in the intervening years and the results were positive. Simply stated, we can monitor the population with the sex attractant and manage it with the virus.

HKS: So, did EPA give the Forest Service permission to use DDT?

REB: Yes.

HKS: Okay.

REB: Reluctantly, hesitantly, but they did with many constraints. And Jack Ward Thomas, a wildlife biologist, had just joined PNW from Massachusetts. He monitored birds in the DDT-sprayed areas. He couldn't find any difference between bird survival in areas with and without DDT. So far as I know that's the last time that the agency ever used DDT -- or any other agency in the U.S. for that matter.

HKS: Introduction of a virus to control an insect outbreak. Are environmentalists, however you want to define it, concerned about that kind of contamination? It's unnatural? It's quasi-natural. Obviously it's better than DDT, but you're still messing with the environment. Biological Control of Forest Insects

REB: Some of the environmentalists are so hostile to forest spraying of any kind that they react viscerally. You know, BT, *Bacillus thuringensis*is widely used a biological control agent for insects, and even then there's hostility to it. So there are some people who are opposed to any spraying. But it didn't take long to win this NPV case which is actually a naturally occurring virus specific to the tussock moth. We went through all of the protocols for testing it for safety and efficacy and it was approved. Russell Train, then heading EPA, presented in person an award to the research team which developed the technologies.

HKS: What does a station director do? You've got this difficult problem, the mechanism is in place, you've got super scientists working on it, how much time do you spend? You've got a lot of things on your plate?

REB: The biggest part of my job at that time was liaison with the National Forest System, because Region 6 had the administrative responsibilities for spraying that eight hundred thousand acre area. They were deeply involved in the consequences and interpretation of the research because they had responsibility for preparation of environmental impact statements and the operational aspects of the control program. Other parts of the job included frequent contacts with the Washington office and various user groups. It was a matter of being a good listener and a cheerleader.

HKS: Right.

REB: As I said before, this was probably the most successful RD&A program of the 3-Bug effort. It was successful because there were two technologies emerging that only needed to be adapted to field application. This brings up another aspect of RD&As. They are good where a good body of knowledge exists that team be sealed up and otherwise adapted to the problem. The difficulty is that they are not good at doing basic research and creating new knowledge. You've got to have technologies emerging or available. To some extent, that was the problem with gypsy moth and especially the southern pine bark beetle. We did not have major breakthroughs to back up the adaptive work. To be sure there were marginal breakthroughs but not major ones. All those RD&A programs were completed within specified time frames and have now been discontinued. We've gone back to more bench science and more basic research.

HKS: I always thought the gypsy moth would be controlled by finding out whatever keeps it under control in Europe, but apparently it's not that simple.

REB: A major strategy for all insect pests is to find parasites and predators that control them in their natural habitats. There have been expeditions to Europe and Asia searching for parasites and predators of the gypsy moth but up to this point they haven't been very successful. We had a marvelous related story here in the Pacific Northwest Station that was highly successful. It had to do with a larch case bearer, a defoliating insect introduced from China. It affected western larch, an important tree common on the east side of the Cascades and in most of the Intermountain West. Tom McClintock, then WO director of Forest Protection Research, was so concerned by

the case bearer defoliation that he said we're just going to drop almost everything and go to work on it. In the meantime, Roger Ryan of the PNW Station was assigned to work on the case bearer. He collected parasites and predators of larch case bearer in China. Within a relatively short time in the 1970s and early 1980s that parasite/predator complex had increased to such an extent that the larch case bearer is no longer a problem. A simple story of successful biological control. The Spotted Owl

HKS: I'm not sure how this fits into your chronology, but it may have been about fifteen years ago. I told you earlier I knew Don Flora well. I was passing through Portland. We chatted for a while and he was saying, tomorrow I'm going over to Bend. He said I don't know if it's going to be a snipe hunt or not. They're studying something called the spotted owl, and I'm going to go out and observe this. He said I'm not sure if it's a joke or not, but I've got to go. Anyway, the station was studying the spotted owl long before it became famous. Is that something you were, was it predicted how serious...

REB: What year was that?

HKS: Well that would have been in the early '80s.

REB: The spotted owl was not a significant issue when I was the station director. I left PNW in 1975. The spotted owl became a concern a year or two later. Eric Forsman, now with Forest Service Research here in Corvallis, wrote his masters and Ph.D. thesis in 1976 and 1980, respectively, here at OSU. The spotted owl moved up in visibility year by year. RD&As

REB: What I wanted to do is introduce the idea of RD&A programs which came out of the Arnold/Dickerman period. And the fact that I saw this from the administrative side. It set a pattern for innovation in research organization that persists to this day. The 3-Bug programs were the start, but then there was the CANUSA, the Canadian-U.S. RD&A program in spruce budworms and SEAM, Surface Environment and Management, which was coal mine reclamation, that came along in the energy crisis years.

HKS: It's in my list of things because in the annual report of the chief, year after year under the section under research, coal mine reclamation was something that for whatever motivates something to get into the chief's report, that was one that made it every year.

REB: That was another RD&A. It followed the ones that I'm talking about here.

HKS: And that's on the eastern national forests.

REB: Western as well.

HKS: Is that right?

REB: The coal fields of Montana and Wyoming were being opened in the late '70s, because western coal had lower sulfur content than the eastern coal. Much western coal continues to move east. It was in the 1970s that the public became concerned about the effects of surface mining on both eastern and western coal fields. The Forest Service began the SEAM program in the mid-1970s with research both in the East and West. We even created a budget line item--SEAM. The RD&A program continued for several years and in my estimation was another one of these success stories, second only to tussock moth and maybe even equal to tussock moth. The research demonstrated both in the East and West that surface mining rehabilitation techniques were available and reliable. Have you noticed how little public concern there is today on environmental consequences of surface mining. The program ultimately was closed and there is little Forest Service research on the subject today. The upshot of this is that the Forest Service developed a whole family of ways to organize research. When I became deputy chief I had almost no interest in generic organization questions, because we had so much flexibility in how

we could put programs together. All I wanted to do was take advantage of the tools that we already had. Institutional reorganization of Forest Service Research was of no interest to me. Now case-by-case groupings of scientists and resources around specific problems were of keen interest. SEAM, COPE, and FIR and the Eisenhower and Pinchot consortia were cases in point. We didn't need more authorities or precedents to put research together in almost any way that we needed or wanted to. A Station View of WO Leadership

HKS: When you were at PNW, that's when Jemison retired and Dickerman became deputy?

REB: No. Arnold was deputy chief when I came to the PNW in '71. He retired from the Forest Service in 1973 to go to the University of Texas. Steve Spurr, the president of the University, was tugging him down to Texas. Steve and Keith had worked together at the University of Michigan, Keith as dean of the School of Natural Resources and Steve, as I recall, dean of the Graduate School.

HKS: That's right.

REB: By that time, Dick Dickerman had lost his wife. John McGuire thought a great deal of Dick. John has given lots of credit lines to Dick and properly so. McGuire appointed Dickerman as the deputy. And Dick comments on that in his letter.

HKS: That letter of Dickerman's, that summary of his that you sent me, said when he became deputy chief, John said he wanted a steady hand, he wanted to settle things down. What needed settling?

REB: I think we're talking about Keith Arnold's...

HKS: You were here at the station. Was that a Washington office settling down?

REB: I think that McGuire and Dickerman were getting feedback about how uncomfortable the stations were with Keith's wide-ranging ideas. I didn't feel that way about Keith because I worked with him. I understood his manner of doing things as you only do when you work day-to-day with a person. I like working with Keith. But I think other stations were not so comfortable. They saw Dick as a steady hand, and that's the way I perceived him then, and still do today.

HKS: Maybe it was Harper commenting that when Keith went to Texas, he really wasn't well suited for the hurly-burly of Forest Service Research. The perception that a civilian would have is Civil Service is pretty calm, you have job security and so forth, but it's characterized as pretty rock and sock 'em operation. I thought it was kind of an interesting characterization.

REB: I reread that Dickerman memo yesterday. There are subtleties in there; you've captured some of them. But Dick was still a remarkably good and loyal lieutenant to Keith Arnold as well as a steadying hand. The Harper/Jemison Years

HKS: In a sense I suppose the way Jemison was to Harper.

REB: Yes, a good parallel.

HKS: A very good lieutenant but also a good...

REB: But a solid performer independently. By the way, Marie and I had dinner with George Jemison a short time ago, and we were reminiscing about these days. George was never critical of Harper, but his wife, Bea, was. [laughter] Oh she didn't like Harper, because he was so demanding and so inconsiderate.

HKS: In other words you didn't work a forty-hour week when you worked for Harper.

REB: Oh no you didn't. George up to that evening had never been critical, except he made one observation when he said, you know Harper was very reluctant to give credit.

HKS: Not in his interview, he's not. This is much later, and I'm not contesting what Jemison said, but if you read Harper's interview, without knowing what actually happened, he certainly gives people credit, maybe not enough.

REB: Yes, I agree. The exchanges I've had with Les Harper would suggest that George was a very capable lieutenant. George would take on such tasks as developing a national program for research, but really the genesis of the idea was with Harper. I have the impression that George was an innovator in his own right, he never got credit for it. For example, that speech, "Let's Get Scientists Out of the Woodshed," which gave rise to the laboratory construction program, I think was his undertaking. We also need to keep in mind that Jemison succeeded Harper as deputy chief. Also, Harper resigned from IUFRO upon his retirement, and Jemison succeeded him, becoming president in 1968. These leadership positions were unlikely to have occurred if Harper had thought less of George Jemison and his abilities.

HKS: In Jemison's interview, he was a little bit critical of Harper in terms of recreation research. Les apparently didn't support the sociological studies, maybe the soft science, he didn't say why. That was one of the things that they disagreed about enough that Jemison wanted it on his record.

REB: Yes, but that was the only critical thing that I've ever seen him do on paper. Les just didn't give visible credit. Now there were other innovators in that day, and Dickerman has suggested to me that I might want to be in touch with them. ****One of them was Joe Pechanec. (Joe declined to comment when I approached him.)

HKS: I know the name.

REB: Joe Pechanec worked for Harper and was in a key staff position in the WO.

HKS: Jemison says that Pechanec and Harper had words from time to time.

REB: Pechanec came out of range management, worked in the Pacific Northwest and later went to the Southeastern Station. He worked for Harper in a key way as a staff assistant. He was one of those innovators and thinkers that made a difference. He was very critical, for example, of the Eisenhower reorganization that took part of range management away from the Forest Service and sent it over to ARS. Joe was given credit for keeping at least some range research in the Forest Service. Aerial Yarding Systems

HKS: FALCON, spruce bud worm, prescribed fire, Alaska, you had some specific topics you wanted to talk about.

REB: Yes. The environmental movement was underway in a major way when I came to PNW. Much of the ire at that time was directed at mountain logging systems. Another one of those innovative organizations was an attempt to speed up research on environmentally acceptable logging and transport systems for the mountains. That was FALCON; Forest Advanced Logging and Conservation.

HKS: Where was this done? I didn't know there was logging engineering in this area.

REB: The Forest Service had a research center in Seattle, engineering and transport systems, headed by Hilton Lysons.

HKS: Okay.

REB: Hilton was an imaginative guy but tough to work with. In any event we outlined a concept called FALCON which was also an RD&A program. Don Flora was giving intellectual leadership to it; we brought Ed Clark out of the Washington office to assist Don. It was intended to develop logging methods on a broad front. There were three principal approaches, balloons, helicopters, and cable systems. That program was moving along and Congressman Wendell Wyatt was on the Appropriations Committee. Constituent groups here, with some collaboration from the Forest Service, approached Wendell Wyatt and he got a very substantial add-on to the budget about 1973. It was three million dollars, a huge add-on for that time. Julia Butler Hansen of Washington was chairperson of the committee, so she and Wyatt had a great deal of influence. That was also during Nixon's second term, and Nixon was beginning to impound congressional add-ons. I don't know if you remember those days or not.

HKS: I do.

REB: Nixon latched onto those FALCON dollars (and many other congressional add-ons) and wouldn't release them. Congress was outraged, but the Congress also knew that it had to do something about budget discipline.

HKS: There was the heliostat too.

REB: That was a modification of balloons and that came along a little bit later. It was the politics of FALCON that I want to call attention to here. Anyway. the PNW was set to get the largest budget add-on that a single Forest Service experiment station ever received. But Nixon wouldn't turn the money loose. Congress knew it had to do something and enacted the Budget Impoundment Act of 1974. I want to come back to that when I come to the period of my being deputy chief because it changed in a substantial way how research budgets were generated in the Forest Service.

HKS: Sure.

REB: Up until the early post-World War II period, budgets were largely built, regionally and locally, by interactions among the Forest Service and constituent groups. I was confronted with that problem when I went into Washington as deputy chief and I'll talk about that a little bit later. So the FALCON program never really blossomed into the full-blown one that we imagined. We continued to pursue the technologies, but much more slowly. Balloons, cable systems, the helicopters--I think we have a pretty good appreciation of what each system can do today as a result of that work.

HKS: Bohemia Lumber Company did that balloon logging, was that in conjunction with this? Was that how it was field tested? I know Stub Stewart pretty well.

REB: Yes. The balloon work already underway was largely done by Bohemia and Stub's brother, Fay. The industry really did the balloon logging work and Bohemia was responsible for it. The other two approaches were done in part by the public agencies, with a lot of cooperation from the industry and the National Forest System.

HKS: How did Bohemia get selected as opposed to Weyerhaeuser or a larger company?

REB: It wasn't a question of being selected. Fay Stewart was already in the balloon business when FALCON came into being. As it turned out, balloons didn't work out very well. There was an amusing story about balloon logging. We always had the question, what would happen to these huge balloons in a snow storm? [laughter] The balloons are seventy-five feet or more in diameter and they have fairly flat top surfaces. We knew that the storms in the mountains could be violent. One day a storm did occur. I don't remember who the logging contractor was, but he took the

balloon off the cable system and hooked it up to a very big tractor, a D-7 or D-8, and he was marching the balloon down the road attached by cable to the tractor. Can you imagine a balloon tethered to the back of a tractor? Overhead? And it was snowing heavily. Suddenly the balloon became unstable. Understand, we didn't know how a balloon would behave in snow. So the balloon is loading with snow and all of a sudden it tipped. Tons and tons of snow, so the story goes, came cascading down and then the balloon snapped upright. The rear end of the tractor came off the ground and then settled back down. You can speculate on how that tractor driver felt. [laughter]

HKS: I was skeptical. It's the amount of time, if it takes you twenty minutes to pull a turn of logs in, you can't make any money at it. The cables are so long.

REB: Conceptually a great idea. But slow. Also helium was expensive and nobody wanted to use cheaper hydrogen. Also, they are easily damaged. Stories about balloons getting pulled into yarding drums and things like that. You can't put up with many of those problems before the system is just not useful. Alright, FALCON was another one of the RD&A programs, and it had some political and budgetary implications for research in general that stayed with me for years afterward. Prescribed Burning Research

HKS: Prescribed fire, that's very fashionable. Congress must love that, during the environmental times. Go out and do what God always intended.

REB: The research on prescribed fire was started, or perhaps it would be better to say reactivated during my time here. When you were here at PNW we were doing slash burning and broadcast burning and that certainly is prescribed burning. The model that I was looking for was understory prescribed burning, patterned after research in the South and my later work in the Lake States. The Douglas-fir tussock moth also called attention to the significant successional changes in the forests of eastern Oregon where shade-tolerant trees were coming on in abundance. The issue of fire and forest succession is still with us; today we label it the forest health problem. Bob Martin was part of a cooperative Forest Service unit at the University of Washington. The purpose of the unit, training fire researchers, was drawing to a close. We transferred Bob to Bend, Oregon, where he started prescribed burning research. He had a special talent for that work, and as a result of that research I am told that eastside Region 6 is burning as much as fifty to sixty thousand acres a year. It started several years ago. Bob left the Forest Service and went to the faculty of the University of California, Berkeley, where he is now conducting fire research and teaching. I think that it was the research program that we started in about 1973 in Bend, Oregon, which had a lot to do with the legitimacy of fire research in eastern Oregon. We've only touched the surface--much more fire research needs to be done.

HKS: Harold Weaver did thirty or forty years worth of research with the Bureau of Indian Affairs. Was that useful in a scientific sense?

REB: Yes, Harold Weaver was, as nearly as I can tell, more a promoter than he was a researcher. His favorite theme was to use fire for thinning in ponderosa pine. And that's an extremely difficult thing. It certainly had a lot to do with stimulating interest in fire. Who was the person who headed the institute in Florida?

HKS: Komarek at Tall Timbers.

REB: Tall Timbers. He was, as nearly as I could tell, in the Harold Weaver mode, an evangelist and a promoter.

HKS: Okay.

REB: I don't want to suggest that the initiation of prescribed burning at Bend was new, there were many antecedent efforts. My concern was that the potential benefits were high and the efforts so minimal.

HKS: I was tutored by Dave Bruce, who was extraordinarily cynical of the people working prescribed burning because of the lack of science, the lack of hypothesis, the lack of structure. They went out and touched it off, and they made notes. Purely descriptive stuff. I couldn't judge, but Dave said that and so I've always remembered that. It became so fashionable. The Park Service was going to burn Yosemite and the photographers were there.

REB: Dave is right on. In my days at Grand Rapids, Minnesota, the year was 1958, Zig Zasada and I visited Charleston, South Carolina, to look at the work that Lee Chaiken had started on the Francis Marion National Forest. Have you ever seen those plots? They are world class, unfortunately destroyed by Hurricane Hugo. We found something that I had always been looking for, and that was an acceptable experimental design for prescribed burning. The study had a series of burning schedules, all replicated. We carried that experimental design back to Grand Rapids in red pine. I think it would meet Dave Bruce's concerns about the quality of research. A number of variations of those study designs have been used elsewhere, but so far as I know not here in the Northwest.

HKS: He's very statistical in his approach to things.

REB: There are appropriate experimental designs to go with prescribed burning. Some of the fire research was descriptive stuff, too, but I always tried to have credible scientific backstopping as well.

HKS: Dave probably had some fire research experience in the South.

REB: Yes, Alexandria, Louisiana, for one. I think we're already revisiting the whole prescribed burning issue in the West. The Bend fire research has been underway for fifteen years, but my instincts tell me that with the forest health issue so dominant now in eastern Oregon and Washington, that we're going to see a dramatic upsurge in the use of fire. Research Coordination

HKS: As I understand it, the Wallowa timber type slops across the boundaries into Region 1. How do you coordinate that as a practical matter? You've got two different experiment station areas, plus two different regional offices, different national forests.

REB: That's in part what the staff groups in Washington, D.C., are supposed to do, but there are less formal systems as well that contribute to coordination.

HKS: Does that work?

REB: Yes, reasonably well. This in part was also a product of Harper's organization of the late 1950s. For example at Grand Rapids, Minnesota, Zasada's--as center leader--responsibilities stopped at the Minnesota border. My responsibilities as the project leader were Lake States wide. In other words, I was responsible for red pine growth and yield studies in Michigan, Wisconsin, and Minnesota. On the question of prescribed burning and wildlife research or any other topic of common interest, some accommodation would be made between say the Intermountain Station and the Pacific Northwest Station. Not always perfectly so, but there is a very high order of understanding about what each other is doing and who's going to do what.

HKS: I can see if you have a really high-class crew...

REB: The problem of research coordination is far more exaggerated in the public's mind than in reality. It is not a major problem. Informal networking goes on among scientists that's just

incredible. And the same thing applies internationally. IUFRO provides a marvelous international networking system among forest researchers.

HKS: Maybe the touchy part of that question I asked is in application, not research.

REB: I think you're right. But in defense I would argue that adaptive research really tends to be site specific, client specific, and you have to go through some of that duplication in order to get that work into practice. But you're right, it's at that end of the RD&A spectrum where you see redundancies. Alaska

HKS: Alaska was in your domain here. Alaska has been an enormously controversial natural resources issue. Some of that controversy must have affected the kinds of research decisions. What to study and when to study and how much money you've got. Is that true?

REB: Yes. Let me back up here just a little bit. Alaska, after World War II, was not part of the Pacific Northwest Station. And I can't remember when it was combined with PNW. You may.

HKS: Not right off hand.

REB: It was in the '50s or the '60s. Some Alaskans resented that state merging with the Pacific Northwest Station. But when I became director it was a part of the station and the Alaska D-2 lands issue was in full flight. You know that the issue was resolution of the native claims. The urgency was triggered by the Prudhoe Bay oil discoveries. I spent lots of time in Alaska with Ken Wright who was the assistant director responsible for Alaska programs. The issues were mainly national forest oriented, but research was at least peripherally involved. The regional forester was Charlie Yates, one of the most difficult people I have ever worked with. Charlie Yates was, of course, ambitious, as were all of us, that there be additional national forests created in Alaska. As it turned out that didn't happen, it became wildlife refuges and national parks. Still, interest in Alaska called attention to a lot of technical issues.

HKS: I would think silviculture would be controversial.

REB: Yes, except that silviculture was mainly a problem for heavily forested southeast Alaska, much of which was already in the Chugach and Tongass national forests. Tundra and taiga vegetation associations in the interior was the focus of concern during the D-2 debates. There was a feeling that research would be important after the D-2 issues were completed, not so much for timber research but for basic ecological studies related to all resources. The Forest Service already had a laboratory in Fairbanks and a research group in Juneau but no laboratory. We wanted a laboratory there and came close to getting it. There was so much money available in Alaska that the state would have built it. Unfortunately, the financial situation in Alaska tightened up just before the money was to have been appropriated. As I recall, our research team at Fairbanks was substantially strengthened during that time, and there were people like Les Vierek and John Zasada (Zig Zasada's son who is now in Corvallis with PNW) who were in Alaska and developed a lot of the creative silvicultural techniques for managing spruce along river flood plains, the only place there was much timber. So we contributed substantially to the scientific technical issues at that time. Science had little impact on the land allocation questions which were political. In the meantime, at Juneau, Admiralty Island and other places were coming up for consideration as wilderness areas, and timber cutting for the Sitka and Ketchikan pulp paper mills was becoming increasingly controversial. Our research program in southeast Alaska also was substantially strengthened during that time. Lots of emphasis in southeast Alaska was placed on silviculture and on anadramous fish.

HKS: Sure.

REB: Partition Alaska into two parts. The interior with the D-2 lands, and southeast Alaska with the Tongass and the Chugach national forests, which has been in the Forest Service hands for a

long time and the two research programs were somewhat different. One more comment. There were some vocal people in Alaska who wanted Alaska to have a separate experiment station. I was not enthusiastic about that, and neither was the chief's office, because it would have added greatly to the costs--the whole administrative structure, and so forth. I think we fairly well fended that off. And that issue so far as I know is now no longer active.

HKS: We've gone through everything on my list for PNW. Research Natural Areas

REB: I mentioned earlier that I was involved in the Natural Areas Program, both with the Society of American Foresters and the Forest Service when I was staff assistant to Carl Ostrom in Washington, D.C. The most active Natural Areas Program among any of the Forest Service regions was here in the Pacific Northwest, going back to 1927. Thornton Munger was an active supporter. Jerry Franklin was the main shaker and the mover on natural areas when I came here. It was a pleasure for me to team up with Jerry to see if we could do more with that program. I especially wanted to draw other agencies like the Bureau of Land Management and the National Park Service and Fish and Wildlife Service and the Nature Conservancy into that program. So Jerry and I developed a program here. We said we need to know what kind of natural areas we have. Up until that time their creation had been more opportunistic than planned. We conducted a workshop to identify overall natural area needs. It had a lot of high level participation from the Forest Service and from other public and private agencies. We developed an inventory of what we had and what we needed so that we could guide the program. It was called the Yellow Book--printed with a yellow cover. It accelerated the creation of natural areas among all agencies. There are two research natural areas, for example, on the Findley Wildlife Refuge about five miles south of here, containing vegetation not found on the national forests.

HKS: Is this tied at least intellectually to the forest biome business?

REB: Related. In any event, the Natural Areas Program had some acceleration at the time, although it wasn't viewed with great enthusiasm by land managers who were under pressure for more grazing areas and more timber areas. A sequel to that story was the emphasis on biodiversity which was written into several pieces of federal legislation. As the land management planners began to work here, they said that this gave them encouragement to be sure that we had vignettes of various kinds of ecosystems. The upshot was that, when I had the Natural Areas Program in Washington, D.C., in the 1960s, we had a hundred research natural areas on the national forests. Today there are over two hundred fifty. In fact it was last month that the ceremony was held for the two hundred fiftieth natural area in the Forest Service, and there are already two or three hundred more in the pipeline. Now imagine, we have two hundred fifty areas in all kinds of vegetation associations that are relatively undisturbed.

HKS: Yes.

REB: As I said earlier, an important program, but one that isn't fully appreciated.

HKS: So the local manager, the district ranger, the forest supervisor, sees this as a complication.

REB: They did earlier. They see it now as an adjunct to the biodiversity requirement. Deputy Chief for Research

REB: A concluding point on my Pacific Northwest days--I began to get inquiries about when I might be willing to come back to Washington, D.C., sometimes not so subtle. My reactions at that time were several. We had four children. A daughter who was in high school, and daughters are particularly sensitive on the moving question. I asked John McGuire and Dick Dickerman, "can you wait until she finishes?" The answer I got was yes. In 1975, after I'd been here four years, the inquiry came again. I wasn't terribly eager to go back. But I had a commitment to do so.

HKS: I guess he was the first chief to do this (Max said he did it too), requiring each regional forester to sign an agreement that they would come to Washington when they were instructed to. Did they make the station directors sign something like that?

REB: No, they did not. We had somewhat more success at getting station directors to move than John or Max did getting regional foresters to move and for reasons that I only partially understand. We tried to consult frequently with station directors and to honor special personal needs. For example, my successor as deputy chief was John Ohman, formerly at the North Central Station. He was asked to move and he said that we have a son that we would like to have finish high school. John McGuire honored that and so did I. You know John Ohman sent a letter to the chief when his son graduated. He noted that his son was graduating from high school and I'm now at your disposal. I thought that was really upbeat. I know about that arrangement with regional foresters, but it was never imposed on station directors. In any event, my immediate family commitments were finished in Oregon and I went back to Washington as associate deputy chief. I filled the slot that Carl Ostrom vacated. About that time, Warren Doolittle filled the slot vacated by Bob Youngs who was also an associate deputy chief. Bob Youngs became director of the Forest Products Laboratory. The question of succession to Dickerman was up in the air for almost a year. Warren Doolittle and I were the two principal candidates. By the way, Dickerman actually retired before his successor was appointed. So Warren Doolittle and I rotated as acting deputy chief. Finally, I think it was nine months later, I was formally appointed as deputy chief.

HKS: John does this, but does the secretary officially appoint the deputy chief?

REB: Yes. It's a supergrade or senior executive position, and the formal approvals are required in the secretary's office. They may actually go to the Civil Service Commission. I think they did after we moved over into the Senior Executive Service. But you can be sure that at that level the chief has enormous influence.

HKS: It's a pretty foolish secretary that would second-guess a chief. Rex Resler

REB: One of the people who probably played a major role in my appointment to the deputy chief's job (I know Warren was disappointed but he was very gracious about it) was Rex Resler the associate chief. Rex is one of the finest people that I've ever worked with. Rex was appointed regional forester R-6, the day I was appointed PNW station director.

HKS: So you worked with him out here closely.

REB: I worked with him here but I also interacted with him through a group of young turks in the Washington office in the late '60s. Rex, as regional forester, was very generous about inviting me to his advisory committee meetings and inviting me to sit in on his R-6 staff meetings. He would come over to visit me at the station headquarters, and regional foresters don't normally do that. It was a warm, warm relationship. Rex stayed in that regional forester job for not more than two years; he went directly back to Washington as associate chief under McGuire. Did McGuire ever comment about Rex as his associate?

HKS: About the political problems he got into. Crested Butte or something like that.

REB: Yes, Crested Butte ski development. I don't know what relationship Rex and John had. Rex was a great idea generator and had some of Keith Arnold's qualities. An idea generator and a guy who could be enthusiastic about a new idea. Rex wanted to be chief, but I'm sure that those political issues about Crested Butte got in the way. Then Bill Towell retired as executive vice-president from the American Forestry Association and Rex went to that job. Rex, for all of his great strengths, was not the person for that association job.

HKS: That's pretty obvious, he stumbled pretty badly there.

REB: Like Keith Arnold, he needed somebody around to counsel, but that doesn't diminish my warm regard for Rex. He worked extremely hard at that AFA job, I used to visit with him frequently. Then he retired, I think somewhat embittered and frustrated. I still see Rex occasionally. I think the world of him and it goes back to those days as staff persons in Washington, D.C., then as regional forester and station director and then deputy chief and associate chief.

HKS: I heard somewhere that Rex was one of the five district rangers that were used as models in Herbert Kaufman's book *The Forest Ranger*. Have you heard that story?

REB: Could be but I've never heard that. Permit me to elaborate on the kind of person Rex was. Rex had been a young forester on the Alsea district of the Siuslaw National Forest. Shortly after Rex became regional forester he took all of his forest supervisors, nineteen of them, and invited me to come along as well. We went on the Corvallis watershed where Rex wanted to show two things. One of them is how you challenge authority and the other one was that he wanted to show that we need to be innovative. The issue was road building. Shortly after Rex graduated from Oregon State University, he was to set up a timber sale in the Corvallis watershed on the Siuslaw. The regional policy was to build roads with a certain radius of curvature and with prescribed widths and grades. And, Rex said we can't do it here in the Corvallis watershed. So, he shortened the turning radius and he steepened the grades, including adverse grades. You didn't do that. All of this was in the face of Charlie Connaughton then R-6 regional forester, who was one of the most intimidating people going. Rex thought he was going to get canned by Charlie, but it was exactly the sort of thing that Charlie was looking for. And, Rex wanted to show this to his top staff as an example.

HKS: Max Peterson tells Charlie Connaughton stories in Region 5. Charlie is pretty famous for his management style.

REB: Yes. Charlie's son Kent, an economist, works for the PNW Station. He was recruited during my PNW days.

HKS: Charlie was on our board, as a matter of fact he was our vice-president. Changing Budget Procedures

HKS: Do you have more comments to make on your time at the Pacific Northwest Station?

REB: I continued to pay annual visits to key staffers and congressional offices in Washington, D.C., during my time at the Pacific Northwest Station. I remember one visit to the staff clerk of Senator Alan Bible's Senate Appropriations Committee. During that time, a longtime colleague, Bob Callaham, was on an internship in Bible's office. I visited first with Callaham, and he told me that he had described to the staff clerk how the Forest Service does its budgeting, including contacts with cooperation. Then I visited with the staff clerk. He looked at me with some irritation. He reached over and picked up a three-ring binder called the Mark-Up Book for the Forest Service. He said these are the additions that have been proposed for the entire Forest Service budget. He held his fingers up (more than two inches apart, and more than half the amendments) and said these are the ones that are proposed for Research. This told him that Research was being extremely active in trying to modify the budget and, of course, he was right. The clerk waved his finger at me and he said, if you keep this up, we'll give you these amendments but we're going to take it out of your base program. The lesson for me was that we had to bring a lot more discipline to the budget process than we had had before. A significant part of my job in the next ten years as deputy chief was to bring some discipline to that process, in so far as possible, without diminishing opportunities to strengthen Research.

HKS: Research was asking for too much, is that what you're saying?

REB: If not too much, at least it was occupying too much of the workload of the committee.

HKS: Oh I see. Denny McMaster talks about the political process in a way I'd never thought about. I guess you sponsored that book.

REB: Yes I did.

HKS: But so much of what happens in Congress is based upon workload, not the merit of the idea behind the bill. I mean clearcutting is not the issue, it's will the bill pass, that's what the issue is.

REB: Yes.

HKS: Bad legislation is legislation that can't pass. Historians don't know that, you see. They think there's some kind of a moral issue in legislation.

REB: In any event that meeting was prophetic in the sense that we had to look once again at the discipline of the budget process. Ten Standard Regions

REB: I mentioned earlier about a meeting in Missoula, Montana, when George Jemison and Reed Bailey, the station director of the Intermountain Station, met with us and announced the closing of the old Rocky Mountain Station. During my time as director of the Pacific Northwest, the Nixon administration was moving to place all of government into ten standard regions.

HKS: I remember that.

REB: The western station directors were meeting surreptitiously to deal with the implications of that because it would have closed some stations and had great displacement effects, particularly on the administrative side of the regions and stations. There was great momentum for ten standard regions, and the Pacific Northwest Station was to have assumed all of the research programs of Idaho. Bob Harris, then director of the Intermountain Station, and I agreed not to keep people in limbo with anxieties hanging out all over. We received a letter passed on by the chief saying, proceed with ten standard regions. Within a day or so Bob Harris and I visited Moscow and Boise, Idaho, and announced that Idaho was joining the Pacific Northwest Station. Some of the people sitting in those rooms were the very same ones who were in the room twenty years earlier when the old Northern Rocky Mountain Station closed. The parallels and the irony of that situation stayed with me for a long time. Did you know that within three or four days, the three Ms. Senators Mansfield, Montoya, and Moss overturned Nixon's decision and the ten standard regions just collapsed. So in all of my later visits to Moscow and Boise, Idaho, I used to tell them that it was great having you in the PNW Station for three days. [laughter]

HKS: My impression of Nixon, my perception of the man, is that he was fundamentally a good administrator, one of the better administrators of our presidency.

REB: That agrees with my view.

HKS: The ten standard regions didn't make sense for the Forest Service, because the forests aren't spread across the country. Was this tied to the Roy Ashe study on reorganizing the government, putting the Forest Service with Interior and that kind of stuff? Or was this wholly separate from that?

REB: I think that was separate. That Roy Ashe issue occurred during the Carter administration, if I recall correctly.

HKS: Wasn't there one too under Nixon? And it happened just before Watergate.

REB: That could well be the move toward ten standard regions. It was the Ashe proposal. I think it is. Nixon began his second term by accepting letters of resignation from most of his senior people and he was going to embark on a whole new direction for the federal government, but by that time he was so encumbered by Watergate that he could never carry that out. I think if he'd been strong in his second term we would see a substantially different government.

HKS: He would have been strong, because he won by a landslide.

REB: A very able guy, but with some serious moral flaws. Selection of Deputy Chief

HKS: To the best of your knowledge and from your vantage point, how was the selection made for you to become deputy chief.

REB: I don't know.

HKS: You don't know.

REB: I don't know but I can guess. I do know that there were conversations among the chief and deputies. I would get little glimpses of vague conversations that I was going to come back to Washington, and the position I was likely to occupy was the associate deputy chief slot or...

HKS: McGuire didn't call you and ask, would you like to come back to Washington? Research needs your kind of leadership, or whatever he would say. Sort of test the water to see if you wanted to come back?

REB: You know if Ed Cliff was obtuse in his dealing with John McGuire, John McGuire was obtuse in dealing with me.

HKS: Hear that John?

REB: John would make some very vague references about coming back to Washington. Never talked about what position I was going into, but I think he thought I knew. I did talk to John about my postponing until our youngest son completed high school and he understood and acquiesced. Actually, as I reflect on my time as deputy chief, there were many internal discussions about succession, often not communicated well with prospective candidates.

HKS: But you weren't interviewed as such for the job. He knew you well enough to know what he was getting.

REB: Late in Ed Cliff's tour of duty, he asked when I was coming back to Washington. Ed was still chief, as I recall, but very close to retirement. I said, I haven't heard anything about it. He kind of put his hand over his mouth and said, oops, I thought you knew. So it strikes me that there's some internal discussions and I kind of knew that I was going back as associate deputy chief.

HKS: Did Dickerman retire a little earlier than he might have?

REB: Yes, I have a hunch that he timed his retirement so that replacement candidates would be at hand.

HKS: Okay.

REB: You'll have to ask Dick how he saw the affair, but in my estimation there were two choices. One was Warren Doolittle, the other one was me, and I'd like to think the Forest Service would do well with either one of us. As I said, Warren was very gracious when I was appointed deputy chief. Bob Youngs was associate deputy chief under Dickerman and became director of the Forest Products Laboratory shortly before Dick retired. Warren Doolittle occupied his associate

deputy chief chair. Carl Ostrom, also an associate deputy chief retired and I occupied that position.

HKS: What I want to be able to find out in this portion of the interview is, what's it like to be a deputy chief. What does a deputy chief really do. You get up in the morning and you shave and have breakfast, you drive into the office and you go in and you sit down and you've got a staff report or the phone rings. What do you do? It's sort of like cruising timber, we're going to take a 5 percent sample, we can't do it all.

REB: Tom Nelson put it this way. He said the three jobs for a deputy chief are budgets, personnel, and programs. That was my perception also and in fact that's the way it turned out. Of the three jobs, the one least forgiving for the deputy chief is leadership on budget matters, because nobody else can do it in all its dimensions. The second is personnel. It's bringing people along to do current jobs and to anticipate future needs. Adverse personnel action, that is addressing personnel problems of various sorts, is also an important and time consuming part of the job. The deputy chief plays an important role here, but some of those things will be done if the deputy chief isn't there. The third area is programs, in my case research, and here I was well fortified. The Washington office research staff consisted of about ninety people, most concerned with research programs, with an additional three thousand in the field, and so you're well served on programs. What should research to do, how to monitor it, how to report it? All of the things that have to do with research itself. I was an active participant in the formulation of research programs, but most of the activities and most of the ideas came from my colleagues in Washington and in the field. The RPA and Research

HKS: Let's talk in a generic sense here. We want to talk about the budget cuts and the Gramm-Rudman effect and all of that, but generically at what point in construction of the research budget do you talk to the chief?

REB: A highly interactive process. Could I take a slightly different approach to that issue? I would like to describe some steps my colleagues and I took to give additional visibility and substance to Research with the aim ultimately of winning more support for it. Most of my predecessors, starting with Earle Clapp, used a variety of devices to accomplish these same ends.

HKS: Sure.

REB: I went back to Washington almost four years to the day after I came to the Northwest. The environment in Washington at that time was heavily oriented toward RPA. Max Peterson had come in from R-8 and was the deputy chief for programs and legislation, which is where RPA was. RPA was a large part of the WO workload. Actually I'd been on Max's advisory committee as a station director even before I went in. You may recall that the first RPA had to be prepared in about sixteen or eighteen months.

HKS: Right.

REB: Humphrey wanted it in a hurry. The first RPA was due in 1975 and the second five years later in 1980. The first RPA was most helpful in increasing funding for the National Forest System. Congress was eager to have a document that would permit them to increase those budgets. As we got into the second RPA period, Max Peterson, John McGuire, and others said the national forests are now financially healthy and whole. Our next installment is going to emphasize research. I knew that when I came into Washington and had a concept to justify an increasing research program in the 1980 RPA. That story has several parts to it.

HKS: In 1978 you get a renewed and enlarged authority to conduct research. Do you want to talk about that law?

REB: Yes I do. I'd like to unfold that story just a little differently.

HKS: In terms of these three categories of what a deputy chief does, legislation comes under programs.

REB: That's a little artificial in terms of research, because legislation really interacts actually with all three--budgets, personnel, and programs.

HKS: Okay, let's talk about that. Now explain again why this law was seen to be necessary from your point of view. You had the 1928 McNary-McSweeny Act. Was there any other statute that authorized research?

REB: Yes. Minor ancillary authorities but McSweeny-McNary was the basic authority for Forest Service Research. I recall John McGuire saying to Research and to State and Private Forestry, clean up your act. We've had two major bills, RPA and the National Forest Management Act. He did not want Research or State and Private Forestry to be caught with incomplete or obsolete legislation as we were with the old Organic Act of 1897.

HKS: Okay, so there was a lesson learned.

REB: Yes.

HKS: You really do have to upgrade the legislation from time to time.

REB: And we in Research and State and Private Forestry wanted to make sure that we weren't caught with outdated or inadequate authorities. That I think was McGuire's attitude. My view was that we also wanted to use new legislation to give visibility and momentum to a research program as Earle Clapp had done in the 1920s with passage of the McSweeny-McNary Act.

HKS: Okay. Forest Service Research and USDA

REB: Are you familiar with the relationship of the Forest Service to the Department of Agriculture in terms of science?

HKS: Only what little bit I've read in my preparation for the interview.

REB: All of my predecessors, at least all of my post-World War II predecessors, were keenly sensitive to the science and education agencies of the rest of Agriculture. That means Agricultural Research Service, Economic Research Service, Cooperative State Research Service, and Cooperative Extension Service.

HKS: Sensitive in what way? Be sure you're compatible with that or what?

REB: Because much of the science policy of the Department of Agriculture including the Forest Service was coming out of that group. For the Forest Service, the principal contact in USDA was McIntire-Stennis, which was administered by the Cooperative Research Service.

HKS: I see.

REB: The top level USDA planning committee was called ARPAC, Agricultural Research Policy Advisory Committee, and that was the pinnacle of the policy-related issues in science in the Department of Agriculture. Forestry research was represented on ARPAC by the deputy chief for research, by a forestry school dean, and by the director of the Cooperative State Research Service. Agricultural interests made up all the rest of the 20-25 person committee. It was chaired by the assistant secretary and one of the deans or vice-presidents of a university. When I first came into Washington, I sat in on those meetings with Dickerman. The assistant secretary at that time was Bob Long, and his university counterpart was Orville Bentley, then dean of agriculture at

the University of Illinois, and highly regarded by the agricultural community. I'd gotten to know Orville over the years. In the first ARPAC meeting, Bentley and Long were going over a major agricultural research planning report from a conference in Kansas City. All of the agricultural community felt good about the Kansas City report (ca. 1976) because it sampled a wide range of agricultural users that had commented on priorities for agriculture research. Bentley and Long turned to me and to Don Duncan, who was then representing the forestry schools,...

HKS: I know Don.

REB: They said we want you to do something like this for forestry. That was exactly the challenge I wanted to hear. The forestry schools, CSRS, and the Forest Service then initiated a major involvement of the forest community in research. That led to four regional workshops attended by about two thousand people where a large cross section of users met to suggest research priorities in 1977. It also involved a national conference in 1978 where top level natural resource people commented on the overall national priorities for research. This advice also provided input for research priorities in the RPA. Understand that we were satisfying an agricultural science and education requirement but at the same time laying out a program for Forest Service Research for RPA. I wanted to do something else as part of this. I wanted to deal with some of the current policy issues. Up to that point our concerns had been the content of the research program, not the conduct of it. We convened a major policy workshop at Airlie House outside Washington, D.C., in 1977. Steve Spurr was the chairman and Carl Stoltenberg was the vice-chairman. Dickerman, now retired, was the secretary to that group, and he was working under the auspices of the newly formed Renewable Natural Resources Foundation (RNRF). I'll pursue that story later if you wish. We were anxious to have the community of interest that dealt with forestry research to be larger than forestry. We wanted it to be other disciplines, other agencies. Cooperation with RNRF was one way to do this.

HKS: Give me an example or two of a policy or an issue that you wanted to deal with. What are the policies for research?

REB: There were about eighteen or twenty recommendations out of the Airlie House report on forest and rangeland policies. What we wanted out of this review were new ideas and a strong endorsement for several research-related things, including international forestry, competitive grants, enhanced cooperation, and improved delivery of information. So here we had the content of the program from four regional workshops. And, we had a review of research policy issues from the Airlie House conference. I wanted to use this policy document as background for the drafting new research legislation as suggested earlier by McGuire. Understand that all of these efforts were collaborative with the sixty forestry schools affiliated with McIntire-Stennis, the Cooperative State Research Service, industry and other cooperators. What I was trying to achieve personally was an enlargement of the scientific community that was interested in forestry and forestry research. This wasn't new with the Forest Service, but I'd like to think that I tried to give collaboration and cooperation still more emphasis. As you look at the documents coming out of these conferences, you'll see joint signatures and joint sponsorship of virtually everything that we did. All the time that we were developing this I was participating in the RPA process so that what we did was entirely compatible with RPA. Research on Research

REB: Let me add a couple of more items to this story. I told you earlier how disenchanted I was with the old PPBS zero-budgeting work that we did during the Johnson era. Up to the late '70s I was reluctant to go through any charades of analytic analyses of forestry research. Then we began to see some research coming out of the agricultural community, where highly credible cost-benefit studies had been done on research on corn, on wheat, on dairy cattle, and so forth. It was apparent that some of the methodologies developing here would be useful to forestry. So we created a project on research evaluation at the University of Minnesota where that group of economists had been especially active in agricultural research policy and research analysis. Al Lundgren of the North Central Station did this research with cooperation from the University of Minnesota and several other stations and universities. Out of this research came a group of

studies concerning the benefits and cost-benefit ratios of a whole series of technologies including southern plywood, nursery practices, and so forth. These studies served as analytical background for the Forest Service with its RPA, the forestry schools, and Cooperative State Research Service. At the same time, Bob Callaham, who was the staff director of Forest Environment Research in Washington, suggested that we develop additional justification for forestry research. We commissioned a study later called Criteria for Deciding about Forestry Research Programs. Bob Callaham with all his energy and his colleagues then canvassed about fifteen or sixteen federal departments and agencies and asked how they plan their research. It turns out that there were few new insights from those agencies compared to what we already knew. Another step in that research program justification was the commissioning of a study on basic research chaired by Stan Krugman of the Forest Service and Ellis Cowling of N.C. State University. I wanted to increase the basic research content of the Forest Service program. In any event the task force identified a number of basic research needs important to forestry. New Legislation

HKS: And so you were developing background that would serve RPA and new legislative initiatives?

REB: That was the intent. In the meantime, draft bills were requested by Congress. The three major groups--Research, S&PF, and forestry extension representatives met in a hotel in Crystal City near the Pentagon in 1977. They spent a day or two discussing the content of the legislation and actually drafting the bills. Denny LeMaster calls them the baby bills in that active legislative period of the '70s. I'd like to think the major initiative was coming out of research but State and Private Forestry was also active and a new bill concerning forestry extension was introduced, coming out of extension forestry in the universities. All three of those bills went to the Hill. John Hendee, your classmate, was on the Hill at that time working as I recall, for Congressman Weaver of Oregon. He helped to move those three bills through as did several other key staffers. Do you know those three bills went through without hearings and debate? As I reflect on it, we would have been better off if there had been hearings and more visibility. Thus, we obtained the Forest and Rangeland Renewable Research Act of 1978.

HKS: You would have a better legislative history if there's ever a lawsuit.

REB: Right, but there is more to it, including parallels to the McSweeny-McNary Act. Some have said the Forest Service didn't need the McSweeny-McNary Act as we had all of the authorities needed in the old Organic Act of 1897 which authorized as I recall, the Forest Service to conduct such investigations as are necessary.

HKS: Sure.

REB: But Clapp and others, I think, wanted more visibility for forestry research and the SAF study and debates surrounding the McSweeny-McNary Act did that. I just wish we'd had a more catchy title for the research bill. In any event, the research bill (Rangeland Renewable Resources Research Act of 1978) passed but public attention was so heavily focused on national forest activities that there really wasn't very much visibility for Research.

HKS: Did the environmental group have a position on this or not? Did you know?

REB: They may have. Jim Giltmier, Bob Wolfe, John Hendee, and Dennis LeMaster were the principal staff people on the Hill at that time. I have no doubt that they touched bases with all the critical constituents. At that time, there simply was little conflict with Research, S&PF, or forestry extension.

HKS: Denny was at SAF at that time.

REB: I think Denny was with Congressman Weaver. In any event, the principal staff got all of the support and endorsement that they needed. So the bill just slipped through. One day it was

passed. Then it seemed the rational and desirable thing to do. There are likely to be long-term, positive benefits from a well-conceived forestry research legislation and there are RPA-related benefits as well.

HKS: Who is it that sponsored that bill?

REB: It may have been Talmadge.

HKS: I think it was Talmadge.

REB: On the Senate side, and perhaps Weaver on the House side. But those three bills just slipped through so quietly that no one knew that they passed.

HKS: The Forest and Rangeland Renewable Resources Research Act of 1978 kind of ties it in to RPA in terms of the cadence of and cumbersomeness of the title and so forth.

REB: The act restated much of the research authorized by the McSweeny-McNary Act. It also emphasized multiple-use research including the addition of outdoor recreation studies, forest protection in all its dimensions, a broad definition of forest utilization, and a careful and wide-ranging restatement of forest assessment and economics research. In short, we attempted to anticipate as many as possible of the areas of inquiry that forestry and renewal natural resources might one day address. It also added authorities for international forestry research, competitive grants, and encouraged cooperation, coordination, and extension. It even has a section concerning acceptance of grants and gifts, a problem then occurring at FPL.

HKS: So it wasn't just housekeeping. Did it broaden the authority or sharpen it?

REB: It broadened the authority and resolved some vagueness in the McSweeny-McNary Act and it filled in some other niches. For example, the authority to do international forestry research was strongly enhanced.

HKS: You said earlier that the Forest Service lost range research early on.

REB: In the Eisenhower years.

HKS: It went over to the Agricultural Research Service.

REB: Most of it did. A little bit stayed.

HKS: Did it come back?

REB: So far as I know it did not. Joe Pechanec was the person who was very active on that question in the early 1950s. The Forest Service lost the Miles City, Montana, location which was primarily range research but I think we retained the Desert Experimental Forest in Utah and the Santa Rita Experimental Range in Arizona, for reasons that I don't understand. It's probably because they had a forested component with them. The Forest Service still does range research, especially in areas associated with national forests and grasslands.

HKS: The Forest Service is a part of Agriculture and you have to be compatible. Were you ever constrained by USDA research policy?

REB: No. In fact I think the opposite was true. Agricultural research policy was very helpful to the Forest Service. Take the Person-in-Job concept and the pioneering research concept that came out of ARS. Budget support was generally positive, although the support was muted because the Forest Service comes under the Appropriation Subcommittee for Interior and Related Agencies,

while all the remainder of Agriculture comes under the Agriculture Subcommittee for Appropriations.

HKS: Would it be fair to say that Research operates more closely with USDA than the National Forest System in terms of running across the street and talking to those guys?

REB: Yes. But it's a two-track system, and the deputy chief for research must work with both groups. I don't want to say that we played one off against the other, but reinforcement came from the science and education groups of USDA. In my time as deputy chief, Keith Shea was especially effective at representing Research with the USDA agencies.

HKS: Is this a logical time to talk about how all the activities were integrated into a coherent program for forestry research?

REB: The research program, the one requested by Orville Bentley and Bob Long, and that jointly involved the forestry schools and the Forest Service, was published about 1978. For the Forest Service, the same material was published as part of the RPA in 1980. In the meantime we were satisfying, I think successfully, Rupert Cutler, Howard York, John Fedkiw, and the other budget-makers in the Department of Agriculture about the importance of the forestry research program. The climate for research in USDA, this was during Carter's years, was also supportive of research. Secretary John Block, formerly an Illinois corn farmer, often described how much research meant to him during the corn blight outbreak of about 1970. So, in the first year after the 1980 RPA was approved, Forest Service Research received, as I recall, an 8 percent budget increase from OMB and expected to get an 8 percent budget increase for the next several years. I thought that was a successful outcome of the research priority setting, the research policy and legislation, and the various analyses of research accomplishments and needs. The success was to be short-lived.

HKS: The rationale behind that increase was the Forest Service can't pull off RPA without some very significant research.

REB: That was part of the rationale.

HKS: So if Congress had accepted the program it had to give more money to research.

REB: That's right. that was all built into it. But the consultations and the economic justification and the new legislation, all of that tended to reinforce that rationale.

HKS: Was there any grumbling from the field that Research was getting more money than...

REB: Not that I could detect. The National Forest System wasn't grumbling because they had received hundreds of millions of dollars of increases in those first two or three years of RPA.

HKS: What does OMB say about all this anyway? They're always trying to balance the damn budget, and here's the Forest Service going crazy.

REB: OMB had agreed with it because of the justification presented to them, and because the climate for agricultural science and natural resources was favorable.

HKS: OMB, according to Max and McGuire, opposed RPA.

REB: Yes they did.

HKS: Because it took away the president's prerogatives or something.

REB: More so, much more so in the Reagan years than in the Carter years. I hope Max and John elaborate on how RPA finally received approval from President Ford.

HKS: After it passed, though, then OMB was no longer opposed to it.

REB: No, and Carter was interested in natural resources. So, the increase in research was, as I recall, part of the statement of policy that went on the Hill, which committed the administration to increasing research.

HKS: RPA was '74, you're back here in '75, Jerry Ford's still president for another couple of years.

REB: Yes, yes, but this effort really took place in the Carter years. Ford was involved with that first eighteen months increment of RPA, the one with eighteen months or so to complete. So, what we have is a whole series of steps that were intended to build a rationale and a justification for increased research and we were successful. No problems with Congress on the 7 or 8 percent increase during the first year. The second research budget also went to Congress with a proposed 7 to 8 percent increase, and then Carter lost the 1980 election to Reagan. The disappointment to me was that these budget increases would have represented the first overall growth of Forest Service Research since the Harper/Jemison days.

HKS: Yes, Carter was defeated. What happened next?

REB: And, I often use my hands to describe what happened. The budget was going like this for Research [gestures upward], and it was in the administration's budget, it wasn't a congressional add-on. That made it much more durable. Soon after the Reagan administration came in, they sent an amended budget to the Hill, so the second 7-8 percent increase went like this [gesturing downward]. In fact it declined more steeply than it went up. This is when John Crowell came into office as assistant secretary. You may want me to comment on the contrast between Cutler and Crowell.

HKS: Oh yes, definitely you want to talk about the changes in administration, how that translates out on the land. So you get a lot of money, I mean you almost have to go out and hire a bunch of people to start spending that kind of increase, right?

REB: Yes, programs were growing.

HKS: And under Civil Service job tenure, it's a little bit dicey, right? What happens?

REB: No it really wasn't. We could easily handle 7 to 8 percent increases among equipment needs, construction, some recruitment, and extramural or contract research. So we felt pretty good. We, the forestry schools, and the Forest Service felt good about the way that we had built the rationale and justification for the research program. Can I talk about Cutler now? Rupert Cutler

HKS: Absolutely.

REB: Cutler was a person that I knew slightly from my University of Michigan days. He came into the Department of Agriculture with really only one mission in life, it was the Forest Service. Cutler had a fairly large portfolio. He had the Forest Service, Soil Conservation Service, and the science and education agencies of the Department of Agriculture.

HKS: He was well-equipped by educational experience to handle that, wasn't he? More so than the average assistant secretary?

REB: He was a professional but he was a political...

HKS: But he had credentials...

REB: He had credentials if you mean a Ph.D. and a keen interest in the Forest Service and environmental interests. But, his agenda was so narrowly focused that he really cared only about the Forest Service. The agricultural side of science and education soon became disenchanted with Cutler, and they created something called SEA, Science and Education Administration, which was a super agency within the department. SEA had responsibilities for Agricultural Research Service, Cooperative State Research Service, Cooperative Extension Service, and so forth. That disenchantment was to grow as time went on. Cutler continued until, as I recall 1980, and it was obvious that he was becoming a liability. I think it was John Block who was the secretary at that time. Cutler left, he resigned and departed, and that was a poignant moment worth describing. Cutler had accepted a senior job with the Department of Natural Resources in Michigan. He had his furniture all packed and it was ready to go, and Michigan withdrew the offer that day. Several of us who had worked with Cutler liked him as a person. We went over to a morning meeting to wish him well and to offer commiserations. Cutler broke down and was weeping; all of us were affected by that moment. Cutler later joined the Audubon Society as a vice-president, a job that didn't last long.

HKS: Right now he's running a foundation in Virginia.

REB: He's been through two or three foundations before that. A very decent person, strongly ideologically oriented. His Ph.D. dissertation was on some wilderness area, I've forgotten where.

HKS: McGuire was concerned that Rupe wanted to be chief. John timed his retirement in part because he was worried about Cutler.

REB: Yes. All chiefs consider similar possibilities as they approach retirement.

HKS: I suppose, but he was worried that Cutler wanted to be the next chief.

REB: I think the circumstances that surround the retirement may differ. John McGuire invited his lieutenants, one at a time, to ask what he should do about retirement. John then described the options. I couldn't be very helpful, but was pleased to have been asked. Now I suspect that Cutler's very strong environmental orientation had a lot to do with who came in as his successor. If Cutler was strongly left-leaning, and environmentally-oriented, Crowell was business and far right-leaning. Cutler's ideology on one side gave rise to an ideology almost as extreme on the other side.

HKS: Cutler told me, we were standing in a lobby outside a conference room last November, he said that he was the one that tipped the decision toward Max succeeding McGuire. But he's an environmentalist. Why would he have picked Max? Max is not an anti-environmentalist by any means, but I'm kind of surprised.

REB: My information at that time is imperfect, but there were two contenders.

HKS: Doug Leisz?

REB: Doug Leisz and Max. Max was, it was obvious to all of us that worked with him daily, eager for that job and was lobbying hard for it. Did Max talk to you at all about any of his lobbying efforts?

HKS: Yes, he didn't talk about it quite that way, but yes he goes into quite a bit of detail. He and Doug Leisz got together and they made this agreement that they'd support each other.

REB: I'm sure that Max was lobbying through the Carter administration and some of the advisors to Carter. Max previously was in Atlanta as regional forester and got to know some of the people that surrounded Carter.

HKS: That's right. Appointment of John Crowell

REB: If I read the signals correctly, if the people in the agency had had a choice between Leisz and Max, they would have chosen Doug Leisz. However, they fully accepted Max once he was appointed. After some delay and controversy in obtaining Senate approval, John Crowell was appointed assistant secretary in 1981. Max wanted some of the deputies to meet Crowell so we went to his office for our first meeting. For me it was easy to visit with Crowell because he's a steelhead fisherman; he came from the Northwest, and we know some of the same people.

HKS: Did you know him from your time there?

REB: I didn't know him personally, but we knew several people in common and we liked the out-of-doors in the Northwest. At that first meeting each of the deputies described highlights of their program. When my time came, I offered a few observations. Crowell abruptly said that Research should be a hundred million dollar a year program. He said he had serious reservations at this time when there is a timber shortage and so many other needs whether we can afford a $140 million research program. The abruptness of his observation was startling. It portended things to come.

HKS: So he was looking at the budget priorities, rather than saying you're doing unnecessary research.

REB: He wasn't sympathetic to research at all. He said, I don't understand research and he asked for help. But he never understood research, nor it's importance to, for example, Georgia Pacific and Louisiana Pacific, his former employees. I think that he was getting a lot of his input from some of the industry people out here, who didn't associate their business with research. Industry and Research

HKS: That was my follow-up question. Does industry generally support the research budget?

REB: No, on the average not with enthusiasm. However, there are many positive exceptions to this generalization.

HKS: It seems like they are getting a lot of freebies, and they'd be for that.

REB: One example out here was with a company, which I won't name, that was very proud of its computerized sawing programs. They didn't want the Forest Service doing anything with computer development for sawmill operations.

HKS: I see. A proprietary interest they had in certain kinds of research.

REB: What they lost sight of is that the original computerizing of the sawmill industry came out of the Forest Service. It was a program called Best Opening Face from the Forest Products Laboratory in Madison, Wisconsin. But they'd forgotten the seminal work. They were already into the second, third, and the fourth generation of computer development. Lots of similar things happened.

HKS: I remember, when I was at the station, that some industrial spokesman said that the Forest Service ought to focus on basic research, let industry do the applied research.

REB: You're opening up a whole additional set of questions. The captains of industry by and large either were indifferent or not supportive of Forest Service Research. But the groups within

industry, the land managers and product development scientists could be very supportive and often were. The industry was especially supportive of research to backstop lumber grade standards, fire safety procedures, and pesticide studies involving safety and efficacy.

HKS: What company besides Weyerhaeuser has substantial forestry research, as opposed to products development?

REB: Weyerhaeuser was the leading one. The second one was Westvaco and West Virginia Pulp and Paper Company, in the Southeast. Crown Zellerbach had a research program. Did you know Clarence Richen?

HKS: Only by name.

REB: Clarence is a grand old guy. He went to Crown Zellerbach from the Forest Service about the time of WWII and became their vice-president for lands. He was extremely supportive of research.

HKS: I met him, matter of fact, when I was here for the Starker lecture last fall. So they worked on silvicultural things and nursery studies and...

REB: Yes. The question about the Forest Service relationships with industry is a recurring one. I think all of us at one time or another were required to justify why we were doing research in forest products. The question was so predictable that every one of us had a hip pocket rationale to use in congressional hearings or budget hearings or...

HKS: I want to talk about the Forest Products Lab at some time.

REB: Yes, okay. During the Carter administration we went through one of those periodic bouts about who should do research, and it was the utilization research that came under the greatest scrutiny. Why are you doing work at the Forest Products Laboratory in Madison? Why shouldn't the industry do it? The budget implications of those questions were clear. We developed a rationale for that kind of research. One is basic, risky long-term research. The industry isn't going to do it. Another reason was that there are many small entrepreneurs, small sawmill operators, small wood processing plants and so forth, who could never mount a research program on their own. Another was research that backs up consumer interests such as safety and reliability of preservatives, toxic chemicals, and fire retardants. Still another was to backstop regulatory programs including the toxic consequences of wood preservatives and pesticides in forest products and forestry. The one place that we always said industry ought to do its own research was where there were clear proprietary interests. But every once in a while someone would ask that question either on the Hill or at OMB with budget implications. Congressional Relations On the day that Dickerman retired, for example, there was the usual morning chief and staff meeting. John McGuire announced that he had the sad duty of announcing Dick Dickerman's retirement. On that very afternoon we got our first budget marks from the Hill. I think it came out of the house, saying that they were giving us a three million dollar budget reduction in forest products research. I've often kidded Dick that this was the kind of a legacy he handed off.

HKS: That's right.

REB: But it stemmed from the same set of concerns. The industry ought to do the research. Warren Doolittle and I mobilized, with help from FPL, all of the support we could find around the country, much of it from industry, saying we needed that research. They intervened and the three million dollars were restored.

HKS: Generally these cuts would come out of the Republican side?

REB: No, I think it was independent of party. The appropriations process really is relatively party-free. Julia Butler Hansen was a Democrat, Wendell Wyatt was a Republican, and yet they worked hand-in-glove, worked very closely together. There was relatively little partisan politics that I ever saw in the appropriations committees.

HKS: In the media it's always that Teddy Kennedy wants more money for health care and the Republicans want more for something else. Some issues are very politicized, but forestry was not politicized.

REB: There are thirteen appropriations committees, and each one will tend to have a personality all its own; they behave differently. The Interior and related committees were relatively free of partisan politics.

HKS: How much of your budget came out of Interior as opposed to Agriculture, in terms of committees?

REB: All of the research funds came out of the Interior and Related Agencies Committee.

HKS: Okay.

REB: Essentially none out of Agriculture except some tree planting programs, administered by S&PF. One of the significant historical events about Forest Service appropriations is that jurisdiction shifted from the Agriculture Appropriations Committee in the 1950s over to the Interior and Related Agencies Committee. Most people don't comment on that very much, but I have the impression that that was a significant event.

HKS: Was it a good event?

REB: A significant positive event for the Forest Service.

HKS: Why? Because the agricultural people in Congress really only cared about wheat and soybeans?

REB: That's exactly right. This moved all of the Forest Service programs then into a much more compatible budget environment. For example, there were almost no research budgets before in the Interior committee; that meant that Forest Service budgets had more visibility.

HKS: And that's good, it doesn't become a target then.

REB: I want to mention another small but important change in the format of research budgets. In all of the budget hearings that I sat in on, and there must have been ten or eleven of them, the ordering of discussion was always National Forest System first, Research next, followed by State and Private Forestry, and then the administrative parts of the budget. This is the way the material was presented, and that really set the agenda for the budget hearings. The National Forest System was, as I said, soaring at that time. I made the suggestion to John McGuire (John and Max were very supportive for more visibility for Research) how about inverting the order of the budget presentation? John and Max agreed, and so we put Research first, State and Private Forestry second, and National Forest System third.

HKS: I noticed that. I didn't know how significant it was, but the annual reports of the chief changed the sequence too. Research was the lead-off a lot of times.

REB: Okay. I think that was also RPA-related. But something so simple led the members of the committee into Research first. That had a significant impact on visibility and the discussions that took place in the Appropriations Committee. Very much to the advantage of Research in my estimation.

HKS: Did you testify directly as deputy chief?

REB: Yes.

HKS: Do other deputy chiefs testify directly?

REB: Yes. McGuire handled this somewhat differently than Max. Max wanted the testimony to flow through him. John would have his deputies at the table. John would sit at the center of the table with the associate chief, Rex Resler, beside him. The assistant secretary and the other deputies, Research, National Forest System, and State and Private Forestry with occasionally others. As the discussion went along, John would turn the questions to the appropriate person.

HKS: So he was always there.

REB: He was always there. Of course his principal preparation was for the National Forest System. That was the big business for John and for most of the others. John was very generous in deferring to me on technical questions, and Rex Resler would occasionally intervene and defer questions to me, so I was getting a fair amount of visibility and airtime during McGuire's tenure. Max handled it somewhat differently. He sat at the head table, and his associate along with the assistant secretary, as I recall, would sit there with him. Only one deputy would be at that table, and it was the one whose program was under review. Max tried to funnel much of the discussion through himself.

HKS: So under John all of the deputy chiefs were there as part of a learning experience for you too, you got information first hand, so to speak. Did it instill a sense of the mood of Congress?

REB: Much of the learning was done before we went into the room. But yes, the hearings were essential to capturing the mood of Congress.

HKS: I know, but you saw the interchange.

REB: Yes, I sat in on budget hearings as a staff assistant, but often in the back row, and more directly as deputy chief under both John and Max. So I had some feel for how that process worked. The way to characterize appropriations hearings is a little bit like preparing for preliminary exams for a Ph.D. It all came together at that time and there were relatively few second chances.

HKS: You really had to have the data in your head, you couldn't be fumbling...

REB: Much of it in your head. All of us carried notebooks. I always went over the budget item by item with the staff directors and the background for them and their consequences, trying to anticipate questions.

HKS: Did you brief congressional staff ahead of time?

REB: We had some interaction with congressional staff. Generally, at their initiation. They would ask, for example, are there questions that you would like to have asked for the record.

HKS: Alright.

REB: They wanted to build a record. Can you give us background on this issue or that issue? There was often strong interaction between...

HKS: Did they ever tip you off? Did they tip you off and say the senator's really looking for things to cut this year, so you better have something to cut.

REB: Occasionally, but rarely directly from the congressional staffers. That usually came through the chief's office and through the Forest Service budget coordinator, who were key people. Did you know Gordon Fox?

HKS: By name only.

REB: Gordon was a consummate contact with the Congress, and he had the confidence of the staffs on the Hill. They would feed information back to him, and Gordon would consult with each of us. They had confidence in him, and so did we. There were others that followed. All were outstanding people crucial to the well-being of budgets and far more important to the agency than their organizational positions would suggest.

HKS: Did you ever sense that other agencies were less or better prepared than the Forest Service when it comes to budget?

REB: I really have no way of knowing. But I have the feeling that the Forest Service relationships with the Congress were the envy of many agencies. Not always flawless, but better than most.

HKS: What you're saying sounds so logical that you wonder why everyone's not doing this. I guess there's a certain sense of esprit de corps in the Forest Service that probably doesn't exist in other agencies.

REB: I think that's right. Maybe they are not as astute in their relationships with the Hill. I remember when John became chief, he said to the RF&Ds, the regional foresters and directors, that he intended to spend 25 percent of his time on congressional relations, 25 percent in administration, and 50 percent with the agency in the field, or something like that. The numbers may be wrong, but John clearly knew he had a major responsibility with the Hill.

HKS: To us civilians, testifying in Congress is kind of mysterious. All you see are the news clips on Dan Rather or something. It's a controversy, and Congress is beating up on this witness. Most of us don't really know what happens in the hearing, because we never really see it.

REB: One of the things that insures some success in the Forest Service, at least one of the ingredients, is the ability to work with the Congress. You know I gave you some anecdotes earlier about how staffers would call.

HKS: Right. Is it almost always done very professionally with courtesy, or could you have an antagonist?

REB: That happens--antagonisms develop. For example, I've been told that Dale Robertson had a run in with Senator Fowler of Georgia who was turned off. This may have happened late in Max's administration or early in Dale's. And that antagonism, I think persists to some extent today.

HKS: That's a really tough one to shake.

REB: Let me relate another story. I came to know Dick McArdle reasonably well after he retired. He was just a delight to visit with. He told me a story. He said, you know I don't you to repeat this, but when J. F. Kennedy came in, Orville Freeman was named secretary of agriculture. McArdle, who had been chief for eight years and was highly regarded, knew that Freeman, who had been governor of Minnesota, wanted to bring in his own team. Actually it was George Selke, formerly with Freeman in Minnesota and then with him in USDA, who wanted to replace McArdle. Richard McArdle, who enjoyed a very special relationship with Senator George Aiken, called him and described his current situation. Aiken responded that he would call Jack and see what he can do

about it. Jack of course was John F. Kennedy. McArdle said, you know I never heard anymore about being replaced. I told you earlier about Warren Doolittle visiting Aiken.

HKS: Right.

REB: When he told George Aiken that the Burlington Laboratory was number two on his priorities, Aiken called Ed Cliff who was then chief and just ate his butt out. McArdle used to have breakfast on Saturday mornings with George Aiken.

HKS: What was the tie there?

REB: It was a very personal relationship. In any event, McArdle would have breakfast with Aiken on Saturday mornings when both were in town, and they developed a very special personal relationship. Those often exist among staffers and among members of Congress. Ed Cliff didn't do that, and that was one of the things that make Aiken so unhappy when the laboratory question came along. The next thing that happened was that Ed Cliff and Warren Doolittle paid a personal visit to Aiken.

HKS: Was Aiken a chairman of the committee?

REB: Aiken was chairman, I think of the Agriculture Committee, not Appropriations but Authorization--the committee that passed the laws. It exercised a lot of oversight, and Aiken was a conservative but highly regarded Republican. He and McArdle got along very well.

HKS: I hear so many anecdotes of this genre that the White House doesn't check with Congress before it makes a public statement. Maybe they do a lot and you hear it only when they don't. They forget that there's a key congressman that's got a vested interest in some idea who's just not going to go along with it. Seems so fundamental.

REB: Those congressional relationships are extremely sensitive, and were a point of discussion in many, many internal chief and staff meetings. Who's going to deal with this congressman or that one. Two or three fairly senior people in the Forest Service did not enjoy good relationships with Congress. One of the tough jobs for the chief is to recognize those problems and keep the person away from the Hill.

HKS: Just because he didn't think it was important or he just didn't have the...

REB: Somehow the chemistry wasn't right. It may have been the issue, it may have been a personality conflict, it could be any of those...

HKS: But everyone at that level realizes the importance of congressional relations?

REB: I told you that Phil Briegleb took me around to all of the key congressional offices when I became director of the PNW. Bob Tarrant and I did the same thing when it came my time to leave the PNW.

HKS: Right.

REB: As deputy chief, I did the same thing with my successor, John Ohman. I could get appointments with staffers or occasionally with members of Congress fairly easily although it made Max and Lamar Beasley a little nervous at times.

HKS: Where do you park as a civilian in Washington, D.C.? There's a lot of running up to the Hill. Do you take cabs, is there a parking spot? Everyone's important in Washington in some sense. How do you find a place?

REB: It was fairly easy to get from USDA to Capitol Hill. Sometimes I walked in order to get some exercise. But you know cabs and metro in Washington were cheap with easy access to the Hill.

HKS: McGuire said he always drove, and he said he always talked the parking lot guards into a parking spot. He said he was sure he could get one, and he said he always did. It's sort of trivial, but you've got to be there on time and you don't want to be looking for a parking spot.

REB: Okay. Permit me to carry congressional relations a step further. The House Appropriations Subcommittee was chaired by Congressman Sidney Yates. I have the impression that Yates' number one target in the Reagan years was James Watt, secretary of Interior. There were many stories around about how he badgered and worked on Watt. The story also is that the second man on his hit list was John Crowell. So we would go into Appropriations hearings (this was in the early '80s) and now Research is the first item on the agenda. Yates would start by calling on me and begin to ask a series of questions. Crowell sat at the hearing table and as the years went on, Yates began to play me off against Crowell, not a comfortable position for me. I don't know whether Max or John ever mentioned that.

HKS: No.

REB: But Yates would ask me some questions and then ask Crowell a question about the value of the research. Crowell would say, well it can be postponed, and the Yates would say, "Dr. Buckman, do you think this research is important?" I would issue some kind of a disclaimer because I was expected to support the administration budget. Yates would keep coming back to me, do you really believe that? Then I would begin to say to Yates what I really believed. This became a pattern in the House Appropriations hearings for a matter of three or four years while Crowell was there. There were times when I think I spent more time testifying in Appropriations than Max did.

HKS: I wrote to each station director saying I was going to interview you and asked for questions. One of them came back, ask Bob about his sparring with Congressman Yates.

REB: That could have come from any of them. I don't know whether it was sparring or not.

HKS: Was he being mischievous when he was doing this with you and Crowell, or did he really want to set something up?

REB: I think maybe it was a mixture of both. He didn't think much of Crowell; he was looking for a rationale to support research and he was probably kind of bored with some of the national forest items which had been coming up over and over again.

HKS: Now the assistant secretary would typically sit through all of the budget hearings.

REB: Yes.

HKS: And comment with an opening statement?

REB: Yes.

HKS: And then sort of keep quiet unless called on?

REB: The assistant secretary would intervene on policy related issues. In fact, on policy related issues John or Max would turn to the assistant secretary and let them deal with them. As an example of a policy related issues--do you believe we should have more wilderness or less wilderness or something like that.

HKS: So the chief routinely deferred to the assistant secretary...

REB: On significant policy issues the chief would always do it. On technical issues, of course the chief and his lieutenants...

HKS: This would be the same with Cutler? Crowell's Agenda

REB: Yes, yes. Now Crowell brought with him an agenda that was very narrowly focused on timber. He dealt with that issue as a conservative Republican who had been active in the forest industry (legal advisor to Georgia Pacific and Louisiana Pacific). He thought that the Forest Service was wasting resources here in the West. He was searching for every way that he could to increase the timber cut, with special emphasis on the Pacific Northwest. He would give us, for example, a reduced research budget and then even after that was accepted by the Department of Agriculture he would go over and lobby OMB to reduce it still more so he could get another road built or another three or four hundred million board feet of timber cut. He was narrowly focused. As a person Crowell was a very warm individual. I have visited with him several times since we both returned to the Northwest. As a top level policy maker, he was inept and naive. I've often said to friends he was a well-educated plodder, an ideologue. He could have accomplished some of his agenda if he'd just listened. But he alienated the South, he alienated the supporters of State and Private Forestry, he alienated the supporters of Research. He did one good thing; he resigned after four years.

HKS: How come people like that aren't replaced? Why doesn't the secretary see this guy is screwing things up, he's alienating the South. It doesn't help the larger program to do that.

REB: I'm not sure that the secretary really had time to deal with the Crowell agenda. I think that was partly true in Cutler's case too. The assistant secretary is really the key policy person for the Forest Service in USDA.

HKS: In the Reagan years we had Jim Watt and we had the big flap at EPA and Ruckelshaus was brought back. I guess Crowell was sort of below radar in that combat zone.

REB: Crowell wasn't below radar, but he was the lightening rod, he was taking the heat. He wasn't deferring these issues to the secretary or...

HKS: That makes him a good guy from the secretary's perspective.

REB: From the secretary's perspective, no penalty for me, Crowell's taking the heat. But he did some awfully naive things. Did anybody ever talk about his Audubon speech?

HKS: No, Max referred to him a few times. He had lunch with Crowell and Cutler one time, after they were all three out of office. Max said, you know if I could have put you two guys in a sack and shook you up and taken the average, my life would have been a lot easier. And they laughed. That was the only anecdote I've heard.

REB: Crowell was not a vindictive or a bitter person. He was an ideologue. One of the first public appearances for Crowell was a speech before the Audubon Society in Denver. The Forest Service gave him a draft speech which he apparently modified on his way to Denver. Understand that Crowell was a longtime member of the Society. In any event, his speech was poorly received. Max or John, I don't recall which, reported back that Crowell couldn't understand why this happened.

HKS: Sometimes attorneys tend to be that way because law requires an adversary relationship. You don't take a balanced view, if you're a lawyer. You just take one side, at least in litigation.

REB: But, I didn't see the compromise or the conciliatory role that I think Crowell ought to have played. He knew he needed to bring somebody in from the South, and he was trying to recruit as

his deputy assistant secretary the state forester of Mississippi, whose name escapes me. He didn't get that person who was a former Weyerhaeuser employee. Crowell just had a capacity to alienating people that he needed to make his program go; and, he didn't listen very well.

HKS: I'm working with one of his associates, Doug MacCleery, right now.

REB: MacCleery was Crowell's NFMA man.

HKS: He's deputy director of timber management now. We Americans believe in the democratic process. The candidate says, if I'm elected I'm going to do one, two, three, and they get elected and sometimes they actually try to do those things. When you go from a Carter to a Reagan, it's really abrupt. A lot of people think that's good; it's long overdue; we should have done this long ago. When we went from Ford to Carter, we shifted the other way. But when you're in there running a federal agency, and it goes through a shift, it's quite a bit of chaos. How hard is it really to make some of these shifts?

REB: In my case the shift was dramatic and painful because...

HKS: The budget cuts...

REB: My program was strongly conditioned by budgets. Research requires relatively little new legislation from year-to-year--not like the national forests. Budgets and their justification is the heart of the issue with OMB and the Congress.

HKS: When does Gramm-Rudman kick in?

REB: Gramm-Rudman was actually a post-retirement affair for me.

HKS: Okay.

REB: I think I told you earlier that one of the most useful things that I acquired at Harvard was how the Administration and especially the Congress looks at the agencies--congressional supervision of public policy. That served me well, but you have to have instincts for dealing with Congress, and the people and the personalities involved in order to be successful. There were others who were far better at it than me.

HKS: You mentioned during the break that Congress frequently would restore some of Crowell's cuts. How did he feel about that? Did he think you were going around him?

REB: Yes. He was very unhappy. He never talked to me personally about it, but he talked to Max and Dale Robinson. He was unhappy that John Ohman's State and Private Forestry budget and especially the Research budget were being restored, contrary to his wishes.

HKS: He didn't believe that it was all Congress's initiative, that you guys must have been in there working with them.

REB: In some respects he was right.

HKS: Sure.

REB: During testimony I would go through the disclaimers that an agency and an administration witness has to go through, but I'm sure that the nonverbal signals were that I really didn't believe it [laughter]. We were in a desperate situation. Imagine a $140 million budget; overlay inflation, each year it cost more to do business, and Crowell wanting to push that budget down to $100 million. Those are draconian cuts. I really was secretly pleased when we would get those

restorations. Yates seemed to enjoy those exchanges as well. Yates wrote me a nice letter when I retired.

HKS: That's nice. Budget Cuts

REB: One of the consequences of the Reagan/Crowell budgets is that they quickly got into personnel cuts. We were confronted with budgets that resulted in 5 to 10 percent cutbacks in people. The first year to two after Reagan, I would ask the nine station directors including FPL, and the staff directors in Washington, to come in and we would go over those budget cuts person by person, location by location. If we cut back a program, I wanted it to be consistent and coherent. Kind of a gallows humor--these meetings were called "Christmas parties," because they always occurred just before Christmas. This period was very hard on station directors. They had to identify positions that would be cut. They couldn't talk about it because the president's budget is administratively confidential until it's released to the Congress. But late in January or thereabouts, the station directors would then have to announce the termination of this location and/or the proposed loss of a specific position.

HKS: The position would actually be terminated at the end of that fiscal year?

REB: It had to be terminated during the fiscal year for which appropriations were made.

HKS: So people would get about a six month notice for forced closing.

REB: The budget wouldn't be fully enacted until just before the new fiscal year began. So the person was on notice from about the first of February until the first of October that his position was slated for abandonment, or that location was slated for termination.

HKS: How in the world do you deal with budget cuts and at the same time affirmative action requirements when you have to go out and recruit new employees? Congress speaks with forked tongue, they say you've got to hire, they make it a law, you've got to hire those kinds of people, and then they take your money away.

REB: Yes, and there are bumping rights and things that go with it. We developed a set of criteria about how we would administer that program. I knew that if we, for example, terminated locations in Yates' district or somebody else's district, the Washington Monument syndrome, to use an old cliché, that that would be quickly transparent. So we developed a set of criteria that included such things as--can this research be postponed, is it nearing maturity, can it be terminated? Are there retirements or resignations or other attrition that we can take advantage of? How productive is this research? We had about six or eight criteria. I wanted the justification for those budget cutbacks to be as objective as we possibly could. Wouldn't you know it the first year that we did this, Senator McClure of Idaho was chairing the Senate Appropriations Committee and I was testifying. He said, Dr. Buckman, the cutbacks that you are proposing affect five out of the eight senators on this committee, how come? It was apparent that he was ready to badger the hell out of me. I went through those criteria, and I said, "Senator McClure, we did not consider location, we used these criteria." I stayed with that approach for as long as I was deputy chief. It made the budget much easier to defend. Back to the people impacts and the job that the station directors had, they had to bear that anxiety and that pain. There's just no way to win those situations. A person will say, "why me?"

HKS: Sure.

REB: In fact the thing that happened was that there was sufficient restoration that we really could greatly reduce the personnel impacts. Budget cuts had impacts on other things.

HKS: Were the reductions generally program-related or was this a chance to get rid of the less productive scientists?

REB: Some of that was involved, and we did it within laws and regulations. But, in any event, the restorations generally covered the people problems. I mentioned to you previously prescribed burning research in Bend, Oregon. The Bend location was one slated for termination. We would have moved Bob Martin to another location, but he was so embittered that he left the Forest Service and went to the University of California at Berkeley--a loss for the station. Those budget cutbacks enabled us to make some program adjustments that we otherwise would might have wanted to make anyway such as termination of unproductive units. The upshot was that cuts were proposed; the Congress would make some adjustments, but we never came back to the same starting point. People would have retired; they would have transferred; they would have done something else. Even in those trying days we were able to generate some discretionary funding that could be used for program redirection. I took advantage of that. For example, I wanted the Forest Service to get into biotechnology research. I took some of those funds and sent them to the Pacific Southwest Station and the North Central Station to work on biotechnology.

HKS: Give me an example of a biotechnology project.

REB: Genetic engineering, moving DNA and genes around. For example, inserting a gene for herbicide resistance into a woody plant, that was one of the successful things that the North Central Station did. I wanted the two smallest stations, North Central and Pacific Southwest, to be the recipients of some of those surplus funds. Do you see what I'm saying, in that yo-yo process--cutback and partial restoration--we generated some surplus funds even in those days to create new programs. Biotechnology was one. I also mentioned an economics project on research evaluation of the North Central Station that served us very well and that was created with those kinds of funds. So the program could shift somewhat even in those days.

HKS: I suppose from the terms of just dealing with people it gave you a lever. Look, I'm dealing with Congress, we're going to have to make these shifts. That made the people in the field more receptive to things you wanted to do.

REB: Yes, but, taking people's jobs away from them is a brutal...

HKS: I do want to talk about minorities' hiring requirements at some point. I don't know how significant you think it is. More on Congressional Relations

REB: I want to comment a bit more about Congress. If I were to characterize effective relationships with Congress, it might go like this. They tend to be highly personal. Relationships develop that can be extremely effective, sometimes without regard to party. There are a couple of things that are absolutely essential, and one of those is trust. Congress tends to work with a handshake or a nod, and if you do anything to violate a trust you can be rendered ineffective.

HKS: How well do you get to know a member of Congress? Are you on a first name basis when you're out fishing and you're really friends in that sense, is that possible?

REB: Almost. Now that doesn't help with everyone, there are various degrees of formality. Bob Wolfe enjoyed unusually effective working relationships with many very senior members of Congress. Mansfield and many others.

HKS: He was an employee of Congress.

REB: He was with Congressional Research Service, Library of Congress.

HKS: Okay.

REB: Let me give an example. Bob Duncan was the Oregonian on the Appropriations Subcommittee in the mid-1970s when RPA came out. Duncan was the chief pusher that made budgets in the National Forest System go so far. I knew him and I think I called him Bob. One day Marie and I went to an Oregon state party in Washington, D.C., I knew the members of Congress from Oregon just have to show up. It's obvious that they divide those responsibilities, and on that day Duncan was covering for the Oregon delegation. He was bored to tears. He knew me from Appropriations, so he came over to visit. He asked how our new chief was doing? I said, "Fine." He said, "You know I'd like to visit with him sometime." This was just after Max had become chief. He said, "Why don't you give me a call?" So I told Max and Doug Leisz (then associate chief) that Bob Duncan would like to visit. I called Duncan, and he said come on down after work on a certain day. After we arrived, he turned to this staff assistant and said "Get a case of beer." We sat in Duncan's office for two or three hours drinking beer and talking about general forestry things. Those are the kinds of relationships that can be just extraordinarily helpful to the agency and pleasant besides. There are some protocol questions that one just has be sensitive to. You have to be sensitive about the timing of announcements and opportunities to gain the member of Congress visibility in his district. If you don't do that; if you're not sensitive to that sort of thing it can arouse some...

HKS: If you develop a new lab in some district, they announce it, you don't announce it.

REB: Oh you seek opportunities for them to do it. You have to be very careful about feeding this to a Republican in a democratic administration and vice versa but there are often ways to get around this problem too. The system almost requires the interplay between the agency and Congress. Congress can't work in isolation and neither can the agency, it's essential that there be interaction.

HKS: Is there more interaction with the House or with the Senate?

REB: Probably the House because there are more members of Congress, and they have more time. But some of the Senate relationships can be extremely important too. Everybody in the Forest Service knows the heavyweights--Byrd of West Virginia, Leahy of Vermont, Hatfield of Oregon, and in earlier years many others. Talmadge and McGuire got along very well during those critical days of NFMA. Did McGuire ever talk about being invited by Senator Jennings Randolph to West Virginia for the post office dedication?

HKS: I don't think so. He did say that he believes one of the primary reasons he got to be chief was good relationships he had made in Congress when he was associate chief. He was well known on the Hill.

REB: Did he talk about the markup of the NFMA?

HKS: Yes.

REB: When Talmadge invited him up to the table? You said, most people don't understand relationships with Congress, and I have tried to characterize them as I saw them.

HKS: We all study civics and we learn how government works, but most of us don't really have any hands-on experience with how a bill really comes along. That's why I found Denny LeMaster's book so useful. It gave me a different slant on how Congress really functions. And you're saying the same kinds of things. I think it's very important to know what really happens, and the fact that so much is personal relationships.

REB: They're terribly important. Confidence in what you say and what you do. If Max had a problem, it was he didn't know how to say, "I don't know." He would talk sometimes too much and too long, and I have a suspicion that's one of the reasons why Yates turned to me, just a hypothesis on my part. Budget Discipline

REB: I would like to pick up one more point before we turn to EEO. I raised the question earlier about budget discipline, budget impoundments and the Budget Reform Act of 1974. That changed in important ways the manner in which Forest Service Research budgets were shepherded through OMB and the Congress. Up until the Budget Impoundment and Reform Act, it was possible for a station director with concurrence of the chief's office to lobby for some local activity such as a research lab or a program increase. With the Budget Impoundment and Reform Act, the authorizing committees of Congress are to be involved in the budget--heretofore the almost exclusive domain of the appropriations committees. The authorizing committees created the budget committee to set overall spending limits. The authorizing committees made recommendations to the budget committees which in turn sent their recommendations to the various appropriations subcommittees. The appropriations committees were supposed to work within those spending limits. That meant that the appropriations committees couldn't continually add to their budgets, which had been the pattern from the post-WWII period until 1974. This meant that we just couldn't tolerate anymore of those many requests for budget changes which I described to you in my run-in with Senator Bible's staffer. My office worked very closely with the station directors to say, sure we're going to take some risks; yes, we're going to reach out for budget support but if you go beyond our agreement and Congress provides additional funds, I'm going to ask you where in your station are you going to take the offsetting reductions. If you think about this kind of restraint on stations, it brought high degree of discipline to the budget process--unpleasant but necessary.

HKS: I think I missed the point in this amendment process. Amendments to what, to Congress, to OMB's, whose budget was amended? Who was Research amending? Which budget that you were using?

REB: The president's budget would be submitted to the Congress, and all of the amendments relate to the president's budget. The president's budget is the base document around which the whole debate occurs. When I say budget amendments, I mean particularly as modifying the president's budget.

HKS: But who's generating the amendments, you?

REB: In a formal sense the committees generate the amendments. If requested, the agency provides background information. What happened is that it led to a change in the long-term way we interacted with Congress. There were friends of Forest Service Research who wanted to support our programs; we would encourage them to testify before the committee as outside witnesses. The appropriations committees, especially the House, have a day or two where people interested in that budget can testify, Tom McClintock was an especially good friend and supporter and Neil Sampson of AFA. There were two or three others who would usually with the RPA as a basic document. The committee staffs then come back and say this program has been suggested by such and such a witness; give us your capability to address the research programs that are suggested. These came to be called "capability statements." We would work out the locations and the nature of the project and return to the Hill. This was really significant during hearings because Yates would ask, what are your priorities, what do you want, where would you put the emphasis? Of course I couldn't testify outside of the president's budget but I could call attention to those capability statements. Now this is subtle, but it was terribly important in the way the budget was organized. That served as the basis then for amending the budget. Those capability statements really were ways of telling the committees our priorities. And, we weren't violating laws when we did it.

HKS: It's a common folklore, and McGuire said it's true. The Forest Service does very well at budget time compared to most agencies.

REB: I think that's right.

HKS: He said it's the Forest Service, the FBI, and the Institutes of Public Health. Congress liked those three agencies better than the White House liked them, and if anyone got more money it would be those three.

REB: Those three agencies get budget increases for somewhat different reasons.

HKS: Sure. But Congress understood, I guess, the importance of what they were doing. They liked what they did as opposed to the other agencies. The BLM doesn't get more money than asked for.

REB: What I'm trying to do here is address the most important single issue that a deputy chief has to be concerned about.

HKS: That's exactly what we want to do.

REB: Budgets are the one thing that no one else can deal with but the chief and, for separate program areas, the deputy chiefs.

HKS: Since 1915, Research has been administratively separate from the rest of the Forest Service, joined only at the chief's office. Does that give the deputy chief of Research a degree of autonomy that the other deputies don't have?

REB: Yes. It does give Research a bit more autonomy for two or three reasons. One is that Research isn't well understood by the other arms of the service and some of the issues are quite technical. Another reason is that the focus for action in the Forest Service are the national forests which make up about 90 percent of the budget. During the '70s and '80s, the chief, the associate chief, the deputy chief of the National Forests System, the deputy chief of programs and legislation, all essentially administering the national forests. Tom Nelson wasn't in charge of the national forests, he shared it with the others because that's where the problems and action were. Essentially no one troubled me except when they had a few idle moments, and so I had a great deal of autonomy, and that reflected in the appropriations hearings. McGuire who came from Research would defer to me because he didn't know some of the details. Max's main concerns were with the national forests. But, this issue goes back many years before my time as deputy chief. You may recall a memo that Earle Clapp wrote in 1937 in which he was protesting the way that Research was being treated as he moved from the assistant chief of Research up to associate chief. He was troubled by it. Harper was troubled by it. And Harper, as nearly as I can tell, was extremely aggressive at pursuing the interests of Research. I've been told a number of times that McArdle was really quite uncomfortable with Harper's aggressiveness at times. On the other hand, if Harper hadn't been so vigorous at pursuing research budget interests, the research program in the Forest Service would have been much smaller. The relationship of Research to the rest of the Forest Service has been an issue for as long as I can remember, or have read, going back to 1915. It's an uncomfortable relationship. Still, there are examples in my memory where the relationship has been outstanding and highly productive. Cases in point involved the Chippewa National Forest in R-9 and the H. J. Andrews Experimental Forest in the Willamette N.F.

HKS: I understand. Some of it is just a little jealousy. We certainly experienced it when I worked at PNW going out into the field measuring slash plots. I'd always introduce myself to the ranger, told him I'd be working on the district. Most of them didn't know the plots were on their districts, I mean how would they know. I ran into some real hostility, because I was from Research.

REB: I'd like to comment on that point later, by way of conclusion. Harper was especially aggressive though, and I think his successors inherited some of the animosity and the resentment that went with it.

HKS: How does Research interact with the National Forest Administration to know what they think their problems are. Technology transfer is a two-way street. You have RF&D meetings, that's an opportunity to talk about it.

REB: Yes, permit me to deal with the NFA relationship first.

HKS: Are the RF&D meetings an important vehicle for cooperation?

REB: Yes, they are. It's a more important vehicle for establishing a framework and environment for relationships than it is for identifying research priorities or joint tasks. But once that working relationship is established, it then sets the tone for people who actually do the work or set the priorities. You know, one of the most difficult questions that I've been asked through time is to describe how research sets priorities. Generalized answers are rarely satisfying. It's only when one deals with specific programs that answers become more concrete.

HKS: Sure.

REB: However, I would often turn that generalized question back to the national forests by asking how they decide priorities for the RFA or the Forest Plans under NFMA? In many respects, the processes are parallel. It's an imperfect integrative process where one samples the users and the public and then match funds, people, past costs, and historical patterns to determine what you're going to do.

HKS: I'm sure that there's a lot of interest in wildlife biology that didn't exist ten years ago, because of the Rare and Endangered Species Act. You've got to know more about these critters than we ever knew before. Budget Impoundments

HKS: You wanted to talk about budget impoundments.

REB: The Budget Impoundment and Reform Act of 1974 changed substantially the way that we justified and mobilized support for budgets.

HKS: So that would prevent John Crowell, then, when you had your budget restored, of actually having it impounded. I mean he couldn't do that, could he?

REB: No, he could not.

HKS: But he could have under Nixon. I mean the rules changed.

REB: Nixon did it for a short time but it quickly became a constitutional question involving division of presidential and congressional power.

HKS: I understand what the issue is.

REB: But after the Budget Impoundment Act, the administration could not withhold funds. That's probably one of the reasons why presidents today are now asking for line-item veto and balanced budget amendments to law and to the Constitution. So that they can reach into those budgets and eliminate specific items. Congress isn't about to give them that authority.

HKS: Carter to Reagan, Cutler to Crowell, you've talked quite a bit about that, but do you want to talk anymore about the shift between Carter to Reagan? Obviously it was abrupt and dramatic when it happened.

REB: Perhaps a sentence or two by way of summary. The Carter years were very favorable to research. The program was growing; it was accepted; but the Reagan/Crowell years had a

trajectory that was just the opposite; it was a declining budget. The way that my office operated changed dramatically in the Crowell years. It was an almost 180 degree reversal in trends.

HKS: One of the station directors suggested I ask you about the impact of the Sagebrush Rebellion on research priorities. I thought what in the world could that have on research priorities, but I'll ask the question.

REB: As I recall, essentially none. One impression that comes to me today, however, is how differently natural resource issues look from this small city (Corvallis) vantage point than they did from the Washington, D.C. perspective. Independence of Research

HKS: Independence of research, you wanted to talk about that. You sent me a letter that Max wrote to a state forester on the subject of reorganizing the Forest Service for research to dovetail at the regional level rather than the Washington level. I haven't thought of that in terms of independence of research, but clearly it is.

REB: It will take a few minutes to develop this point, but independence is one of the most important issues to the research arm of the Forest Service. You may recall that Earle Clapp touched on that point in his 1937 letter, and every deputy chief that I am familiar with in the intervening years has been concerned about the question also, Harper, Dickerman, Arnold, all of them. There were few issues that were more important to me than for the ability of research to independently pursue questions, to analyze results and to bring them forth. In my ten years as deputy chief, no chief of the Forest Service, not John McGuire, not Max Peterson, ever told me what we could or could not do or ever challenged any of the findings that scientists brought forth. If they had said these findings are not appropriate for the time, you've got to change something, or withhold information, I would have been most troubled to the point of departing.

HKS: Do you know of any grumblings from the field that Research has discovered something that challenges Forest Service policy and therefore Research ought not to do that?

REB: I've heard that occasionally from lower level people in NFS, but never from the chief or his immediate staff. To carry this a step further, I had the feeling that John and particularly Max Peterson not only wanted an independent research group, but they were searching, they were eager, for alternative ways of looking at the national forests. As I said, I did hear from subordinates but still senior people that the reserved areas for spotted owls are way too big, or there's no regeneration problem on Afognak Island or something like that. But I dismissed that sort of thing, and it was never a problem.

HKS: Could you elaborate on the example you used a few minutes ago about the letter from a state forester.

REB: Yes, and this occurred at a time when station and staff directors were concerned about how Max would view research. This wasn't a question with John McGuire who came from a research background but it was with Max. The concern was highlighted when Max consolidated Region 8 and the southern area of State and Private Forestry under the regional forester. There were lots of questions within the agency about where Max would seek the next consolidation. Then the letter came in from the state forester of one of the southern states who said essentially that the consolidation of Region 8 and the southern area seemed to be working, well how about consolidating research into that organization? Max passed the letter on to me and we then visited for some time about how we would respond. I prepared a draft response and gave it to Max for approval. Max's stand and mine too was yes we've got to streamline administrative activities and where possible share services and facilities, but Research must remain independent of action programs. Max added one sentence to the letter saying in effect that if Research is merged with an action or an administrative agency, inevitably the administrative agency captures Research. A most significant policy statement concerning Research. I shared that letter with the station

directors and the staff directors. The issue of the independence of Research within the Forest Service was put to at rest at least during Max Peterson's time, with that single letter.

HKS: The quest for independence on the part of Research, isn't that a part of the tension within the Forest Service?

REB: I suspect that it is. Unfortunately, independence carries two meanings here. To the researcher it means independence to ask new questions, to frame inquiries differently, and to publish credible papers. That may not agree with current policy. To NFS and other users it often conveys the impression of being independent, often indifferent, to their problems and needs.

HKS: How do you reconcile these two points of view?

REB: Not as well as I would like. Personalities and different perspectives often exacerbate the problem. However, my observation was that researchers almost invariably are drawing from the same set of societal and natural resource concerns as were users; they simply needed the latitude to approach issues differently using the traditions and methods of science.

HKS: The '78 legislation on research, that doesn't address that issue, or does it? Independence of research.

REB: Not directly. But because it's a separate authorizing act addressed specifically to research, it reinforces the independence of research.

HKS: Will there ever be a concern that a member of Congress might be upset that the Forest Service gets all this money for research and turns out a paper that's critical of government action?

REB: I think that could be. One of the reasons our program in Alaska did not prosper in the late '70s and the early '80s, was that Senator Ted Stevens felt that Forest Service Research was in bed with the more active environmental groups. He felt that the researchers in Juneau were really handmaidens of the Sierra Club.

HKS: Do you think researchers who don't have administrative responsibility might tend to be more environmentalist?

REB: Perhaps so, they may tend to be more inclined toward the environmental side than the development side of natural resource issues but there are so many exceptions that I really wonder if one can generalize.

HKS: Seems to be an enormous advantage that Research has to fulfill its mission that the other parts of the Forest Service don't have. There's a lot of flexibility on hiring in terms of jiggering the job description around to go out and pick your person. You know how to take somebody off a roster, and you're much more likely to have successful programs if you can really pick the person that's fully qualified, rather than veterans' benefits and all the other issues. But with affirmative action, Research has that same load to carry that everyone else does. Is it true that Research has been more able to hire minorities and women and handicapped people than the National Forest Administration because of that job description flexibility? You don't have to get somebody with a forestry background.

REB: I don't think it's so much because of job description flexibility as the fact that Research depends on skills for which females and minorities are more likely to enter. Anthropology, sociology, geography, statistics, mathematics, and so forth. These are the kinds of skills that Research is recruiting and there tend to be more minorities and females in those skills than forestry.

HKS: Is it significant that Research tends to be in urban areas, and more people would rather be in a university than out in the boondocks somewhere.

REB: Yes, rural America tends to be less friendly, especially to minorities. Maybe a little less so to women, and since Research is located in more urbanized areas, some of the social aspects are easier to address.

HKS: Do you feel, did you ever feel, that Research was being asked to take on more than it's fair share of this to take the heat off of the agency?

REB: I didn't experience that but George Jemison certainly did. Every time I visit with George we talk about his experience with Assistant Secretary John Baker and hiring minorities. Dealing with Controversial Issues

HKS: How do you deal with issues that involve science, but are strongly political in nature?

REB: It's never easy. You know one of the dilemmas that we've had for as long as I can remember is how does a person deal with a controversial issue, an environmental issue, a policy issue, without infecting his own value system to the outcome. My first encounter with this was in Grand Rapids, Minnesota with Bud Heinselman. I think an answer is that no one has been able to give an unequivocal response to that dilemma. Some scientists are better at it than others. Logan Norris, now department head in the college and used to be with the Forest Service, is one example. Logan Norris did research on environmental consequences of herbicides, such as 2-4D, 245-T, and other controversial chemicals. Logan was one of the most credible witnesses that the Forest Service ever had. I don't know his value judgments but he could deal with those controversial issues in such a way that he came across as a detached and thoroughly objective scientist. My admonition to scientists who are dealing with controversy is to put your evidence between you and your listener. That's one of those things the scientific method teaches--how to create an hypothesis and then to test it with detachment. But, still there's a very strong personal quality here. Some people simply are not able to separate their values and judgments from their science.

HKS: Presumably there is more detachment in research than in administration, but not necessarily. The kind of people that go into research, theoretically, are independent thinkers, but not always.

REB: But if one uses scientific principles, you can put your evidence between yourself and your listener.

HKS: I forget the name of the fellow who has been the head of the spotted owl study here, but he's certainly been under a lot of pressure.

REB: Jack Ward Thomas.

HKS: People want a certain answer out of that group.

REB: Jack Thomas came to the Pacific Northwest Station during my time here. He's a very forceful and able person, and I don't know that we could have chosen a better person to head the interagency scientific committee dealing with the spotted owl. I've been watching very closely to see how Jack handles these things. I have a suspicion that he feels, personally, a little toward the wildlife side. I think he's handling himself with great detachment. However, some of my industry friends here have raised some questions about Jack. Jack did one thing recently that shows how treacherous this environment is. The *Oregonian* had an article about Lonsdale who was a challenger on the democratic ticket to Les AuCoin for the Senate seat occupied by Bob Packwood. There was a short sentence in Lonsdale's press release that said Jack Ward Thomas was a contributor to his campaign, the only contributor named in the release. Lonsdale is pro-

environment and thinks that the national forests are being badly managed. My reaction to the *Oregonian* article was, Jack, how could you ever permit your name to be used in a political campaign? The issue was not that Jack couldn't contribute to a political campaign. The problem was that he permitted himself to be identified with one point of view. Fortunately, not much came of this issue, but it could have.

HKS: Yes.

REB: Thomas knew that that was a mistake. But so far as I know that's the only time he stumbled on this whole issue.

HKS: Well it's a tough one. We're all supposed to be objective.

REB: I have the feeling that scientists know that they have to find ways to separate their personal value system from their evidence. They too want to be independent and they know the only way they can be independent is to be objective.

HKS: Sometimes the questions go beyond the evidence, and since you're the expert you're asked to extrapolate from the data.

REB: Yes.

HKS: That's where your personal views can take over.

REB: Yes, and Jack Ward Thomas had imperfect evidence on the spotted owl and he and his committee was called upon to extrapolate. Still, he and his committee were, in my estimation, among the best available. Research Personnel

HKS: Let's talk about personnel. We talked about budget, and almost nothing gets done without budget, but nothing gets done without personnel either.

REB: Right. One of the things that I wanted to do when I came into Washington was to enhance the quality of research. That meant emphasis on recruitment and training and anticipation of movement into more responsible positions. I used to monitor statistically some of the demographic and educational characteristics of our work force--ages, level of degree training, and so forth. Of course I was encouraging station and staff directors to pay special attention to recruitment. I encouraged them on a number of occasions that if they saw a potential superstar, a person who clearly had research capacity, they should let me know and we'd find the money. The person was more important than the program in my estimation. I also made the same challenge for unusually attractive EEO recruitment opportunities, I suppose the most important thing, beyond recruitment, was the Person-in-Job career ladder. The Person-in-Job concept is outlined in the Research Grade Evaluation Guide (RGEG) issued by the Civil Service Commission. Agencies had some discretion in developing operating procedures under the RGEG, and these were subject to much discussions and several revisions. The RGEG was especially resented by scientists whose research was at the application and extension end of science. Users, too, resented the guide because they thought it gave short shift to technology transfer. My own view was that the RGEG was intended to reward creativity and originality and that we tended to under-reward our most productive scientist and over-reward the less creative ones. Still, the Person-in-Job concept was better for science than any of the alternatives then available. I wish we could have found a similar system for technical specialists in NFS and S&PF. Far and away the most crucial step in research productivity occurs on the day of recruitment. The next most important step was an attractive career ladder and reward system. Overlaying all of this were enhanced educational opportunities. So the Person-in-Job procedures were an important concern in all of my years as a research administrator. They remained important, they were important before I came on board. Competitive Growth Program I saw some other ways, I thought, to enhance quality of work. The competitive grants program was one of those. The competitive grants

authority in that 1978 legislation permitted research, singly or in combination with any agency, any public agency or private agency. The one thing that counted was the quality of the proposal. What I wanted was for Forest Service people, singly or in combination, to come forth with proposals that would be competitive in a peer-reviewed environment. That meant that our most productive and our most imaginative people would be successful.

HKS: I didn't know until this moment that those grants were available to Forest Service people. I thought they were for people like the Forest History Society or Oregon State University.

REB: You may be thinking of National Science Foundation grants which are not awarded directly to federal employees. USDA and Forest Service competitive grants are available to all qualified scientists.

HKS: Everybody.

REB: Forest Service people could singly or in a variety of combinations compete. We had a number of joint proposals--Forest Service scientist with a university person, Forest Service and an industry scientist.

HKS: Was it construed or could it have been construed, if you got a couple of those grants you were really upward bound, because the agency saw how smart you were?

REB: Not quite in those terms. But we recognized that these grants were highly competitive and reflected better science. That was also an important consideration in the Person-in-Job career evaluations.

HKS: So somebody who didn't want to be stagnant was under some pressure to apply for grants, to be active in this program. And to win occasionally.

REB: We encouraged Forest Service scientists to compete in order to build higher quality science, but also to foster cooperation with others through submission of joint proposals.

HKS: I'm trying to think of the management problems. Here is scientist X working on this long-term program and then he gets a grant, what happens to the program?

REB: In so far as we could during those years of declining budgets we tried to add these funds to those already available to the scientist. I viewed the competitive grants program as a powerful way to bring forth the best and the brightest.

HKS: We were told when I was at the station, and I don't know if it was official or not, that scientists were permitted to work up to 20 percent of their time on a project of their own choice. It's sort of like the farmer in the Soviet Union with his personal plot versus the commune farmer. A lot more productivity per acre on the personal plot.

REB: Yes, discretionary time is desirable and available, but it's not quite as simple as that. Planning is still an important part of the Forest Service research program--it's one of the strengths of the agency. I was restless under what I thought were excessively rigid planning requirements when my career started in the early '50s. But as time went on and I became deputy chief, I had the opportunity to discard formal planning procedures. I didn't do it because I thought it was such a hallmark of quality in the Service, and it is copied by many universities to be sure, some of the rigidities of planning. What the planning procedure requires is that you think through where you're going to go for the next five years. Give us your best estimate about where you see your program is going. Once we have agreement on that and all the signatures are on the project approval document, then the scientist proceeds. But almost as soon as they launch that program, they begin to modify their research, as they get feedback. So there's always some opportunity for the

unanticipated or the exploratory research in that planning process, although it appears to be fairly rigorous at the outset.

HKS: I don't know if you can come up with the answer to this question, maybe it's too general, but are some of these competitive grants large, like a million dollars?

REB: No, during my time they ranged from one hundred to two hundred fifty thousand dollars covering perhaps a three-year period.

HKS: That's the target. How did you administer the Competitive Grants Program?

REB: One of our dilemmas was that the first funding increment to the Competitive Grants Program came to the Forest Service budget. The Forest Service could not administer that program with objectivity. So we immediately transferred the funds to the Office of Science and Education to be administered by the Office of Competitive Grants. In other words, the Forest Service transferred, I think it was five million dollars, to that office so it would be administered independently of the agency--in which case Forest Service scientists could compete. Unfortunately the Competitive Grants Program in the Forest Service was suffering from serious budget erosion and the program eventually disappeared from the agency. We simply could not reduce our workforce and still move a big bundle of money into competitive grants. Anyway, competitive grants were one of the things that I wanted to do to enhance the quality of our research programs. I understand that competitive grants have been restored to USDA but with funds appropriated directly to the Office of Competitive Grants. Location of Research

HKS: How do you choose the location of research laboratories? How does location affect the research environment?

REB: Location of the science workforce is another quality related issue although I'm less sure about unambiguous outcomes. About 60 percent of the seventy-five laboratories in the Forest Service are located on university campuses, and about 75 percent of the Forest Service scientists are at university locations. My predecessors and I wanted our workforce to be located where they could interact, not only with the forestry schools, but with other departments on campus. That's been a policy for a long time, and I tried to reinforce it. Of course, one of the best examples is here in Corvallis. The Forest Service today has thirty scientists and there are about fifty or sixty faculty members next door in the College of Forestry. EPA is located nearby with its science group and resources. And across campus are another forty to fifty scientists with interests in natural resources. And so, this is a rich environment for consultation and cooperation. I had one hesitation about that generalization. I often asked myself, where are the most productive units in the Forest Service, and the paradox was that many of them were not on university campuses. For example, Peter Koch in Alexandria, Louisiana, Phil Larson in Rhinelander, Wisconsin, Jack Ward Thomas at Le Grande, Oregon, and Dave Marquis at Radnor, Pennsylvania. Those are not university locations. So it's a question that we still need to ask. My instincts tell me that we ought to be located in a scientific community, but somehow there's some stimulus that goes with other locations, perhaps proximity to forestry problems. In all probability the principal factor is people. Good people will be successful wherever they are located.

HKS: Do you know the chemistry that caused Oregon State to get this lab rather than University of Washington? There must have been some discussion at the time, both of them wanted it, or both deans would have been in favor of having federal money coming on campus plus the expertise, plus the prestige plus all the rest.

REB: I don't know first-hand the genesis of Corvallis. I suspect that it was part of creating work centers away from station headquarters, which came later in the West than in the East.

HKS: Corvallis is two hours from Portland, Seattle is four hours from Portland, I don't know if that made a difference.

REB: But you know the station has a location in Seattle, too.

HKS: That's right, but it's not anything like this.

REB: No, but it probably could have been. For years the PNW Station maintained a lease for a laboratory site at Sand Point Naval Air Station, a mile or two east of the University of Washington.

HKS: I just wondered what happened, if the congressional delegation got involved in that decision.

REB: Oh very much so, not only at Corvallis but at most laboratory locations. You know there were three phases in Forest Service presence here at OSU--not unlike the history of other university-based locations. Phase one was to be located within the forestry school starting in the mid-'50s. Phase two was constructing the first federal laboratory about 1960. The patron here probably was Senator Wayne Morris. Phase three was construction of the large complex, dedicated about 1976. The patron here clearly was Congressman Wendell Wyatt with whom I worked extensively.

HKS: There may not have been a champion in the Seattle district at that moment.

REB: That's right. Scoop Jackson and Warren Magnuson were never enthusiastic about the Forest Service and did relatively little to support it. Jackson and Magnuson built the defense industry in the state of Washington, but not natural resource programs. Phil Briegleb and I used to talk about that a lot. Jackson apparently was easy to talk to and Magnuson was too, but somewhere they were disenchanted with the Forest Service.

HKS: It strikes me as strange that when you see Portland, and all the western states where the Forest service is, you'd think that all the members of Congress would be supportive.

REB: In general, western members of Congress supported the Forest Service, sometimes mixed with criticism. The support generally went to NFS because of the large number of national forests in the West. But, Research derived support as well.

HKS: Why aren't more station headquarters on university campuses?

REB: There were often discussions about moving station headquarters to major university locations, including here in the Pacific Northwest. It never went very far here because it was so costly and so disruptive. Furthermore, Portland is an important forestry center in its own right and much closer to airports than Corvallis. There are four station headquarters on major university campuses, the Forest Products Laboratory at Madison, the North Central Station in St. Paul, the Rocky Mountain Station at Fort Collins, Colorado, and the Pacific Southwest Station in Berkeley. The Northeastern Station, which moved several times over the years in the Philadelphia area, would have been the logical candidate for a university location.

HKS: Of course the Berkeley campus is four blocks away, but it interacts with the station.

REB: Yes. Ironically, the PSW Station will soon move to Albany, several miles away, because the present space is unsafe from earthquakes. Fortunately, the University of California connection will remain--and the station will be co-located with a major ARS laboratory. The Forest Products Laboratory

HKS: Is this the time to talk about the Forest Products Lab?

REB: If you like.

HKS: To me, again as a civilian looking at the agency, the Forest Products Lab hardly seems to be a part of the Forest Service at all. It seems autonomous. I don't know why I feel that way.

REB: Your feelings are well grounded, but there have been many changes in recent years.

HKS: Does it have its own pipeline to Congress or what?

REB: It still does but with much more consultation with the WO. You know the origins of the Forest Products Laboratory, it was created in 1910. It was the first of the big highly visible research programs of the Forest Service. I think it grew up with a certain arrogance and an independence. FPL directors and their immediate staff worked hard not to come under the supervision of the Washington office. Al Hall was a director of both the Pacific Northwest Station and later the Forest Products Laboratory. He moved back to Portland after he retired. The first day I was on the job as PNW station director, Al visited. In his gruff way he said to me, "I hope they're not trying to tell you how to run the station from Washington, D.C." He was reflecting, as much as anything, his Forest Products Laboratory views. That was of concern, particularly by Les Harper and his successors, that FPL was marching too much to its own drummer. I don't really think that problem was solved until the Dickerman/Arnold era, particularly when Dickerman insisted that the Forest Products Laboratory use the same reporting and planning procedures and organization as the eight regional experiment stations. We also have to recognize that Bob Youngs had a great deal to do with improved relations. Bob Youngs was an assistant director in Madison, came into Washington in the late '60s, went to New Orleans as Southern Station director, and came back to Washington in the early '70s as associate deputy chief. He was and is a very able and accommodating guy. Bob then went back to Madison as the Forest Products Laboratory director about 1975. Bob had a lot to do with removal of the hostile environment that existed for so many years at Madison. My own experiences with the Forest Products Laboratory were both pleasant and positive. The laboratory interacted well with my office and with the other stations. But Bob Youngs, and his successor John Erickson, deserve an enormous amount of credit. Another thing that helped was to have more personnel changes among FPL, WO, and the various stations. That issue that you described no longer exists.

HKS: It would seem to me that the Forest Products Lab would be very vulnerable when a Reagan comes in. Why is the government doing products development? That's what the private sector is so good at. That question must be asked from time to time.

REB: The possibility of that question was in my mind and notebook before every congressional appropriations hearing and every meeting with OMB. You recall, I gave you earlier several criteria by which we justified that Forest Products Laboratory research. All other things being equal, my top priority for strengthening research among the eight regional experiment stations and the FPL was the FPL. The directors were aware of my feelings and were generally supportive. In the real world of research budgeting, however, things were never equal.

HKS: What is the Lab's budget, roughly?

REB: When I retired, about fifteen million dollars.

HKS: Out of one hundred forty?

REB: Yes.

HKS: What's the budget at PNW, looking for a comparison.

REB: At the time I left, about twenty million.

HKS: I don't know if this station is bigger than most or not.

REB: The largest station was the Northeast, and the PNW was second but very close to the top. The smallest stations were PSW and North Central, and I was seeking ways to move funds into those stations.

HKS: The Lab doesn't get much publicity, and I don't know what more there is to ask about the Lab, other than it doesn't seem to fit the model very well. No where else in the agency is anyone concerned about what to make out of wood.

REB: The Lab is well known nationally and globally among specialists in the pulp and paper industry, wood preservation, and solid wood products industry. Its accomplishments over fifty years have been impressive indeed in almost every field of products research.

HKS: Was Crowell for or against the Lab?

REB: He was not excited about anything in research. I was with him at FPL one day. We were looking at research on creating thick panels of structural flake board using steam injection. He asked abruptly, "Why are you doing this research?"

HKS: I can understand the question.

REB: An hour or two earlier we had been looking at a display of conventional structural flake board, and he was marveling at how useful that had been to Louisiana Pacific, his previous employer. He said, "You know we built a major industry in Louisiana Pacific on the structural flake board made from aspen and other low-cost wood." Then two or three hours later he raised hell with me because we were doing this kind of research. I didn't have the temerity to say, "Where do you think structural flake board technology came from Mr. Crowell?" I certainly was tempted to do so. Crowell simply could not connect the generation of technology to public research. Senior Executive Service

HKS: We got off personnel, but I had a personnel-related question, and that's the Senior Executive Service. I never really thought too much about the significance of that, it makes a certain amount of sense. I don't know what happens in other agencies when a new president comes in to change the administration. Do they just clean out the whole Senior Executive Service, or are those jobs fairly stable? They're fairly stable in the Forest Service.

REB: A proportion of the SES positions are reserved for career officers, and provided performance and conduct are satisfactory they're permanent. I don't remember what the proportions are, 60/40 percent or 80/20 percent with the larger proportion reserved for career people, by law and regulation the smaller proportion is available for political appointees. The Senior Executive Service was intended to provide more attractive career ladders for senior people, competitive with industry and the universities. It was supposed to provide a workplace of senior managers who could move from agency to agency and so forth. It hasn't worked out quite that way.

HKS: In the material you sent to help prepare the outline, you mentioned that you received a bonus or a merit, I can't remember the terminology. My interpretation was Max thought you were doing a damn good job. I mean it would have been his recommendation to get you that, right, no one else. He was your supervisor in the management sense.

REB: The Senior Executive treated me very well. Doug Leisz and I were the first recipients of Presidential Rank Awards. There were two, one was meritorious and the other was distinguished. Doug got the highest one, the distinguished award. He got it primarily because of his work in getting a hundred-thousand-acre tract donated to the Forest Service by Shell Oil Company, and Doug deserved it. I got the second one which was called meritorious. I was most pleased to receive it.

HKS: What's the nominating process? I'm trying to think of management. I'm assuming that Max was in the flow of paper in all of this.

REB: I don't remember the details, but it's a nomination that goes for review to the Department of Agriculture and then I think it goes to the Civil Service Commission for approval.

HKS: Each agency is putting up its candidates?

REB: Yes, and they are very limited in number. You may also have noticed that I was a recipient of a number of performance bonuses which were a part of SES.

HKS: There's a lot of evidence in your resume that Max thought you were doing a good job. How many other people..? Relationships with the Chief

REB: Oh, quite a few got performance bonuses. I enjoyed working with Max. There were two or three brittle parts of that relationship. Max was anxious to have national forest people come into the research branch. There was resentment about researchers moving easily into the National Forest System, but not the reverse. Actually, a good number of NFS and S&PF people did come into research, but generally not at top levels. And he forced a position or two on me that I knew weren't going to work out, and they didn't. In many respects, those appointments were symbolic. Max would posture in public about technology transfer or some aspect of research, and the station directors and staff directors tended to resent that. But I would visit with Max in private conversations, and they were positive and meaningful. For example, I would give Max an example of new technology such as truss frame housing or press dry paper, and you know two or three months later he would use almost my same words when he described that process to Congress or somebody else. Max was one of those chiefs like McArdle and Cliff who had remarkable memory recall. There was another aspect about my relationship with Max. During the days of retrenchment, the Crowell days, Max didn't put any premium on standardized organizations. That meant during those cutback deliberations I had a lot of discretion in taking advantage of retirements, transfers, and other vacancies. So the stations, which tended to have a standard organizational pattern, began to have some missing teeth. If one assistant director retired, we would mold the workload around the remaining staff. With this flexibility came opportunities to reduce the administrative work force without maintaining organizational symmetry. I was determined that the administrative side of research would reduce in proportion to the loss of scientists.

HKS: There are several ways we can go here if we want to stay on my outline, which is not important. International Forestry, we need to talk about that, and then you've got Man and Biosphere, and all sorts of things you want to talk about.

REB: Okay, I'd like to scrub Man and Biosphere. I don't think that's terribly critical.

HKS: Okay. Community of Scientific Interest

REB: I still want to mention something about personnel.

HKS: Okay.

REB: I wanted to enlarge the community of scientific interest that was concerned with natural resources, and again this was a matter not of originality but of emphasis on my part. One of the first things I did as deputy chief was where we had senior vacancies and no obvious candidates from within, we reached outside to recruit senior people. We brought in the deans of several forestry schools directly into senior positions in the Forest Service--Bob Dils, dean of Colorado; John Grey, dean in Florida; George Marra, who went to the Forest Products Laboratory, came from Washington State University; and George Brown, now the dean here. Others were Dave Thorud, now dean at Washington; Ross Whaley, now president of SUNY; and let's see, Hank

Montrey from Weyerhaeuser. These were people that I came to know for a variety of reasons including work in science and education in USDA. I wanted to bring people into the agency, some permanently if they would stay, some from sabbaticals or in temporary positions. And it worked out well. We were lucky--we got some of the best. All were senior people who moved easily through the agency and were very effective.

HKS: How about those people who might ordinarily have been next in line?

REB: In almost every case there was no obvious successor. You know if you've an in-house candidate who is clearly able to do the job, you don't go outside. But that option isn't always available. The two-track career system also complicated successional possibilities.

HKS: Of course it's happening a lot throughout the agency now. We're talking to the Forest Service about preparing training documents, because so many people are coming in at senior levels that don't know anything about the Forest Service.

REB: Some of that's brought about by EEO and diversity requirements. Others in the Forest Service brought in senior people as well. Einer Roget, for example, who was the deputy chief for State and Private Forestry, came out of the Soil Conservation Service, and Jerry Miles, deputy chief for administration, was a special case. Jerry went from the Department of Agriculture to the newly formed Department of Energy as chief administrative officer. He was fired by Schlesinger and came back to the Forest Service. Jerry was outstanding and contributed much to the Forest Service. The point I would make here is that these external senior recruits gave a marvelous account of themselves and added a great deal to the perspective of the agency. Unfortunately, during the Reagan years, this was viewed as non-competitive, probably with some political overtones. It became much more difficult to bring people in from the outside under the Intergovernmental Personnel Act, or other procedures. Much of the movement I described occurred during the Carter and proceeding years.

HKS: I was going to ask, and maybe you just answered that, was it difficult at all dealing with the civil service requirements to come up with job descriptions and to demonstrate that they qualify?

REB: Not particularly difficult during the Carter years. But very difficult during the Reagan years. But anyway, that recruitment from the outside, I think with only one or two exceptions, was most helpful to the agency. If I were still with the Forest Service, I would encourage more of it. We talked earlier about the pioneering research units, and I voiced some reservation. The progenitors of that idea, the Agricultural Research Service, also did. But we wanted to find ways to recognize people who were unusually strong performers, and we used less rigorous, rigid ways of doing it. For example, Don Marx, an outstanding mycorrhiza researcher, was considering leaving the Forest Service. I asked what it would require to keep him, and his supervisor replied that he probably would appreciate a little bit of discretionary money and it might be appropriate to give his work a little more recognition. So I went back to Washington and dug up some money, twenty-five thousand dollars, and informed the staff that we were going to retitle Marx's work, Institute for Mycorrhizal Research. Don spent the remainder of his career with the Forest Service and in 1991 was recipient of the prestigious Marcus Wallenberg Prize. Kent Kirk at Madison, Wisconsin, was doing marvelously creative work on the biodegradation of lignin, understanding the enzymatic relationships that cause lignin to decompose. He too was a winner of the Wallenberg Prize, and is now a member of the National Academy of Science. We wanted Kirk to have more visibility, so we created an Institute for Microbial and Biochemical Technology. That was a way of according visibility to our most creative people. A major quality that I was seeking, and others before me have too, was recognition of Forest Service scientists by the superscience agencies like the National Science Foundation and the National Academy of Science. Kirk has been elected to the National Academy of Science, but I was always disappointed that more Forest Service scientists were not. George Hepting of the Southeastern Station and Kirk, I think, are the only two, although I think others are now in the pipeline. The paradox is that Forest Service, particularly the Hubbard Brook research group in New Hampshire, have led collaborators into the National Academy of

Science--Gene Likens and Herb Borman. They were elected to the academy based on some of their cooperative work with Forest Service research.

HKS: I always assumed it was the same problem you have on the university campus, getting tenure for a forest economist because the econ department chewed them up because they're not pure enough. Forestry is a conglomeration of stuff, and I would have thought the National Academy of Sciences has the same hang-up.

REB: Election to the National Academy is probably the premier science recognition, short of a Nobel or Wallenberg prize in the country. The academy has come under a lot of criticism, incest among others. Harvard tends to elect his own and so forth. The fact that some of the smaller institutions just don't have anybody to sponsor them and push, so it's an imperfect process.
Research Collaboration

HKS: How does Forest Service research fit in the larger field of science in general?

REB: I think increasingly better. A major goal of mine, upon returning to Washington, was to enlarge the scientific community that dealt with forestry research. I described to you the planning process where the sixty-one forestry schools under the McIntire-Stennis Act and the Forest Service joined together in the late 1970s to prepare a coordinated research program. That was a joint activity all the way, and I think did a great deal toward building the confidence and cooperation among the forestry schools and the Forest Service. We tried to do other things. I made a special effort to collaborate with the Natural Resources group in the Cooperative State Research Service and with the Department of the Interior Agencies--the Park Service, the Bureau of Land Management, and the Fish and Wildlife Service. We used to have frequent meetings concerning their research programs. I wanted to lay the foundation for more collaborative and cooperative work. One of the products of our efforts was to prepare under one cover a directory of research in all of the agencies so that it would encourage contacts among our field people. I'm holding here just such a directory. It was fairly difficult to establish collaborative research with the Interior agencies, partly because they were smaller, party because their programs tend to be more volatile in terms of people and budgets. I also wanted to link with the industry much better. I borrowed heavily from a mechanism used by the Forest Products Laboratory. Each year the Forest Products Laboratory would invite industry representatives in to comment on their programs, and I thought that procedure was working well. I used to join that meeting in Madison whenever I could. I thought, why don't we try this at the regional experiment stations. So I encouraged industry/experiment station committee meetings, and it worked reasonably well. The forestry schools and the Forest Service would join me in inviting industry groups in. If it didn't foster a lot of collaborative research, it certainly was a mechanism by which people got to know each other and could visit and exchange views; maybe that was the most important output. I don't know how the efforts fared after my retirement. It takes a great deal of time and energy to keep them going.

HKS: Isn't RPA a rationale for this very thing?

REB: Yes, it is.

HKS: The Assessment.

REB: Yes, the Assessment, but also the Program. The RPA program was the vehicle around which we built a lot of these efforts. I also used to on occasion join the state foresters. Each year the state foresters would meet under the auspices of State and Private Forestry. I wanted them to become much more aware of our research programs and be involved in them. The state foresters set up a research committee, but I retired shortly after that came into being. Let me try something else out. I felt there were a number of policy issues, of research issues, that needed an independent voice. The organization that I had my eye on was Resources for the Future. This

started during John McGuire's time. He was sympathetic to the notion and he also knew the then RFF president, Frye, from his California days.

HKS: Right.

REB: Frye was succeeded by Emory Castle, who came from Oregon State University. I wanted to commission some research for the newly forming forestry program within RFF, and over the years sent something like a million dollars to RFF for a variety of things, including the scientific foundation for multiple use management. John Krutilla, an economist with RFF, took the lead in that work and published a book as a result of it. This was another effort to enlarge that scientific community and to give the Forest Service an independent source of information.

HKS: That was before the competitive grants.

REB: Yes, it was. I didn't want the Forest Service to be inward looking. I wanted it to be outward looking, and I wanted to be aggressive in pursuing that goal. If I were still there I would still be tracking that goal.

HKS: It's my stance that the National Forest Administration could use, at least historically, a little more of that broadminded view.

REB: Yes. Probably right, but we also need to keep in mind that the national forests are the focus of most controversial issues in the Forest Service--and NSF is the lightning rod. John McGuire was especially active in trying to maintain outside contacts.

HKS: Its butt's in a sling very often because it's not paying attention.

REB: I still need to reinforce that point. University Research

HKS: When I came to the station in '62, I didn't realize that McIntire-Stennis had just been passed and that's really what was happening. But I wasn't aware of why it was happening. There were some complaints among people I worked with about the quality of research that university faculty were doing, because they used the Forest Service money and then they'd support grad students. There were different agendas. That was the reason they put Forest Service scientists on the campus so they could watch the Forest Service money a little better. This is what I was told. Was there truth to that, was that a significant concern? Every professor has to support graduate students, that's what the university's all about, but Congress didn't say to support graduate students. They want to get research done. Has that been an issue or a difficult thing to unravel on a campus?

REB: I don't know the details of this circumstance that you're talking about, but many criticisms probably were unfair or uninformed. Today those concerns are largely a nonproblem although mutually, generally uninformed criticism still exists. This location, Corvallis, is a case in point. Several of the Forest Service scientists here sit on OSU graduate committees, and occasionally serve as chairperson of that graduate committee. Some of the Forestry Science staff members teach, not so much repetitive undergraduate courses, but special lectures at both undergraduate and graduate levels. The collaboration here is so close that sometimes you can't tell the parent organization of individual scientists. There are always exceptions of course.

HKS: The criticism was that the quality of research that the average professor does wasn't up to Forest Service standards.

REB: That issue cuts both ways.

HKS: I suppose. I mean it could have been professional jealousy, I don't know the motivation behind the comments.

REB: Jealousy and competition sometimes exist. And there is often a tendency to deal in clichés and stereotypes--which usually are uninformed and unfair.

HKS: Yes, I know.

REB: But today the working relationships are excellent. You know, much depends on the personalities of the titular heads of the two organizations. Carl Stoltenberg, dean here for over twenty years, set the stage for collaboration; George Brown, his successor, has followed up. The Pacific Northwest Station also has encouraged these relationships. But there were other locations where personalities got in the way; cooperation became strained. Forest Service Research would have liked to have been at Penn State, or at Purdue, but the deans of those two schools and the Forest Service just didn't see eye to eye.

HKS: So the deans weren't against it in principle, it's just chemistry the didn't work.

REB: Interpersonal relationships had something to do with it, but I think maybe they were against it in principle also.

HKS: Why would that be? They're always looking for new and better things. What made it a problem to a dean of having an institution like this on the campus?

REB: I can only hypothesize. Maybe competition for attention. Maybe a hostility toward federal involvement.

HKS: Well, that's true. It's a famous story but when McIntire-Stennis was on the drawing boards, George Garrett at Yale and Clarence Korstian at Duke, the two private schools, were opposed to it on philosophical grounds that federal money is tainted money.

REB: That could well be.

HKS: Apparently it would have been possible to have included Duke and Yale in McIntire-Stennis. Neither school wanted to be. They were invited but they rejected the application. It seems kind of amazing.

REB: I wonder how much of Pinchot and his followers' pursuit of federal regulation of private forestry practice had to do with that hostility.

HKS: A lot. This is a holdover of a conservative philosophy. Small government is the best government. Government tends to meddle. There's always strings on federal money, as though there's not strings on any money that comes in.

REB: Henry Schmitz, who was dean at Minnesota, was very conservative about that. Still the Lake States Station got along okay with the University of Minnesota, but he was, I understand, hostile toward some federal programs. Contribution of Science

HKS: Bob, tell me about a paper in *Science* that influenced you to the extent that you're still citing it.

REB: You know that the agricultural and the forestry research system in the United States comes under periodic assault and question. Outmoded, pedestrian, unimaginative, and a whole series of other pejorative adjectives. I used to look at those reports, particularly the Glen Pound report of the early '70s, a National Academy sponsored study. Pound was criticizing agricultural research, and indirectly forestry research, because it's organized in similar ways. I kept asking myself, why is it that American agriculture is setting the standards for agricultural research everywhere in the world. How can productivity increases be in the order of 6 percent per year, if it's so outmoded,

pedestrian, and so forth. I didn't find a satisfactory answer to that question until I saw a paper in *Science*(vol. 205: 1101-1107) in 1979, a paper by Evenson, Waggoner, and Ruttan, which described the economic benefits from agricultural research. That paper went something like this: The authors reviewed thirty or thirty-five case studies about the cost-effectiveness of agricultural research. Sure some methodology problems, but the overwhelming evidence was the returns on invested dollars from agricultural research were in the neighborhood of 30 to 35 percent per year, some as high as 100 percent rate of return per year. Then, the paper went on to characterize agricultural research, and let me add parenthetically, indirectly forestry research as well, to characterize the reason the system was so successful. The authors cited two reasons: one is that the agricultural system is highly decentralized and second it's strongly interconnected. What they meant by decentralized is we have fundamental research, we have applied research, we have field experiment stations, we have experimental forests, and so forth. All of which carry the problems closer to the user groups and provides a delivery system for the information. So it's a strongly decentralized system. The second ingredient is that it's a strongly interconnected system. It's articulated, in the words of the authors. It means that scientists know what their peers are doing. We see this in forestry with such interconnecting mechanisms as the Western Forestry and Conservation Association here in the Northwest, the Society of American Foresters, IUFRO, and others--all of which provide those linking mechanisms among technical foresters and researchers. As a result of that *Science* paper, I became more and more certain that the decentralized, interconnected system of forestry research of the U.S. was a source of strength, not a weakness. It wasn't pedestrian. Sure, it could be improved at the edges, but it wasn't pedestrian; it wasn't outmoded; it was the proper way to go. Consequently, after that time I became very much more reluctant to close field locations or to close stations. Sure, we made some corrections and some changes in a few locations, but I felt that a regional system of experiment and satellite locations was terribly important to the well-being of forestry research and provided a highly effective way to interact with user groups.

HKS: This sort of analysis of success of agriculture research must go well with Congress at budget time.

REB: Oh, I think so, but understand that Forest Service appears before Interior committees and Agriculture appears before the Agriculture committees. Still there were enough parallels and enough forestry examples that I used them before our committee hearings.

HKS: That's true, but the research is cost effective. You give us one million dollars and we'll give you two million dollars worth of benefits.

REB: Yes, and those cost-benefit studies, many of which came out of that research project at St. Paul, Minnesota, in the North Central Station, were used in budget hearings. But you know, explanations of the kind that I've just given really served fairly well in Congress. If you know where you're going and why and can give reasons, you really can quiet a lot of criticisms--and, in fact, gain understanding and support.

HKS: Congress must like the Forest Products Lab.

REB: Mixed bag. Yes, they do, people who know what goes on there like it. People who say we've got to make cuts ask, why are you doing this research. Relating to what I said a moment ago, the Lab suffers somewhat from centralization. It's not well-known among potential users and supporters but tries hard to maintain regional contacts. This was one of the benefits we tried to achieve in creating better relationships among the Lab, the WO, and the eight regional stations.

HKS: But the kinds of things the lab does where it's providing engineering and all that to the private sector to...

REB: We always encouraged key people to visit the Forest Products Laboratory. That was almost the first on the agenda for policy makers. Assistant secretaries Crowell, Cutler, and Peter Mayer

were there, members of Congress have also visited. It provides a fascinating way to demonstrate what technology can do.

HKS: I've been to Madison, but never been to the lab.

REB: The technologies that have come out of the Forest Products Laboratory, and there are many of them and they are major, were sometimes easier to describe than were the biological and social sciences. I remember one occasion when we were presenting the first stages of the budget, this time before the secretary of agriculture. The chief and his deputies were sitting across the table from the secretary, Bob Bergland, and some of his budget staff. It was obvious that Bergland was bored to tears. He was yawning, and he was looking at his watch, and casting his eyes around. I had some wood samples with me that had come out of research at Forest Products Laboratory. I said, "Mr. Secretary, these are some examples of recent technologies coming out of our research program"--yellow poplar studs from a new sawing process, other samples of reconstituted wood and reconstituted 2 x 4s. The secretary's eyes brightened and conversations must have gone on for another half hour or forty-five minutes. Finally, he had some kind of a social engagement, it was after six o'clock and somebody was summoning him to leave. But he went from inattention to full-fledged attention, and was so fascinated that the discussions kept going. The story traveled around the Department of Agriculture overnight and the next morning, because all the agencies were undergoing these kinds of budget hearings, and the wags had it that the only way to get the secretary's attention now was with a 2 x 4. [laughter]

HKS: I guess secretaries are human too.

REB: Anyway, I did use a lot of artifacts and samples, and that made for a somewhat easier entree in the appropriations process. It lent an element of concreteness to something that otherwise appears to be fairly abstract.

HKS: Does the Public Affairs Office come to Research for stories to tell?

REB: Yes, and a fair number of Research stories did go through Public Affairs. We could have done a lot better job of that. The journalists used to tell me that science is one of the easiest stories for them to tell. But it was always a chore to supply the stories, scientists were so occupied with their own day-to-day work.

HKS: Taxol. Journalism is running way ahead of science, as it does so often.

REB: There are substantial funds here, right now, some of them from the drug companies, and some I think through appropriations, to understand more about the Pacific yew and its ecology and management. It's big business here at Corvallis today.

HKS: I see a yew outside the entrance here. I thought it's lucky it hasn't been cut down.

REB: I'm not sure that it's a Pacific yew, because there are many species, some introduced. Where should we go from here? International Forestry

HKS: We still have International Forestry.

REB: Another of the goals that I brought with me to Washington was to strengthen International Forestry. International Forestry within the Forest Service has a highly volatile history; on occasion it could be very important, at another time it could subside to virtually nothing, depending on what posture the U.S. had toward other countries at that time. I came into Washington when International Forestry was at a very low ebb. That staff group was down to about six people; there was just no support anywhere. We were looking for ways to strengthen that program. About that time, tropical forestry was beginning to move up in the world agenda, including within USAID. But, it was also a time when budgets were being cut back and ceilings were being lowered. A related

issue here is that a long time friend and colleague, Dr. John D. "Jack" Sullivan, moved from head of natural resources in the Cooperative State Research Service to the science and technology group in USAID. Jack was an old friend and a shaker and a mover and knew how to get things done. When Jack went to USAID there was already some ferment about the Forest Service being the technical repository for forestry, skills useful to USAID. I noticed in your book, *Changing Tropical Forests*, credit is given to Dan Deeley for initiating some interest in science and technology in USAID. I want to add Deeley was important in stimulating interest within USAID, but so were Jack Sullivan, Jack Vanderryn, and Nyle C. Brady. Nyle Brady headed science and technology in USAID and was very supportive. He had just come back from the Philippines where he had been director general of the International Rice Research Institute, one of the premier world agricultural research centers. What this was leading to was that USAID asked the Forest Service to be their source of information on forestry schools. That led to the Forestry Support Program, FSP. And it's still there and it's growing. USAID provided funds for staffing and the Forest Service developed skill rosters and background information that can be called on for forestry programs anywhere in the world. The upshot was that International Forestry started to grow, and then attracted still other funds and more activities. My office directed some additional money into it as well. When I left the agency in 1986, International Forestry had gone from six to twenty-five people. Since then it's gone up another fifteen or twenty and by 1991 achieved separate deputy chief status.

HKS: Let me step back a bit. Why do you think it was in Research as opposed to State and Private Forestry in terms of the kind of assignment that International Forestry had? State and Private Forestry is the outreach part.

REB: Somewhere I read why that happened. It had been one of those opportunistic things.

HKS: I suspect State and Private Forestry didn't care for it and someone in Research did, and that's why it's there.

REB: All of those things could have been true. But in fact, the volume of business in International Forestry was greater in Research than it was in any of the other deputy areas because most of the exchanges were technical and scientific in nature, and that brought the Research group into play. So I had two portfolios, Research and International Forestry. As an extension of your question, there was some discomfort, especially in the National Forest System, about why Research had this activity. They felt that they weren't getting a fair shake. I tried hard to dispel that concern, but I don't think I succeeded very well.

HKS: Some of the experts you would use would come out of the National Forest System.

REB: Yes, and if it were appropriate we went out of our way to involve them, disaster assistance was a case in point. The forest management seminars for foreign forest administrators, started in the early '80s, also was assigned to NFS.

HKS: Bob Spivey, do you know Bob?

REB: Yes.

HKS: Well, he was working in Honduras, that's National Forest Administration providing...

REB: That happened after I retired but as I understand the job, it concerned forest administration, which certainly should have been supplied by NSF or S&PF. The movement toward an independent International Forestry program began, partly through congressional action, partly by some interested non-governmental people in Washington, to create a separate deputy area for International Forestry. That happened with the 1989 Farm Bill. International Forestry was separated in 1991 with Jeff Sirmons the first deputy chief.

HKS: I realize that foreign aid in general takes a beating whenever the economy is down, because why export money when we've got jobs here that need it. International Forestry faces that at budget time. How did Congress view International Forestry? Was it challenged?

REB: Foreign assistance is not a favorite with Congress or their constituents. However, the House Appropriations Committee I think was favorably disposed toward International Forestry because tropical deforestation was and is a current issue. Yates used to question me about it. It seems to me that we did get some budget increases for Hawaii and Puerto Rico.

HKS: The Third World. My specific knowledge is pretty primitive, but it seems to me that expertise from the Soil Conservation Service and all throughout Agriculture would be in great demand. Was there ever a conflict within the department about the Forest Service assignments?

REB: Yes, there was. It happened late in the Carter administration. OICD, Office of International Cooperation and Development, had the principal responsibilities for international programs. Several agencies within USDA had international activities, Agricultural Research Service, and other agencies. During that period international programs were taken from those agencies and placed in OICD headed by a Joan Wallace. The Forest Service program was so small and so diffuse that nobody within that agency reached out to pick it off. The role that OICD has served in intervening years is to mobilize resources, that is people and skills within the department, to address problems around the world. Despite the fact that International Forestry remained with the Forest Service, OICD has been a pretty good supporter. ARS was deeply resentful of having lost International Agriculture. One of the things I attempted to do was to keep our international program fairly diffused and with a low silhouette so it wouldn't be consolidated with OICD. One of the agency's concerns today should be that the higher profile of International Forestry risks this consolidation.

HKS: Agroforestry can be called a kind of forestry or a kind of agriculture. It depends on where you're standing when you describe it.

REB: Yes. The Forest Service has an agroforestry project in Lincoln, Nebraska, today. The questions that you are raising are difficult to answer concisely, because agroforestry represents many different combinations of trees and woody shrubs on one hand and various agronomic, horticultural, and pastoral systems on the other.

HKS: They may not be important.

REB: But the question about the support for International Forestry is an extremely volatile one. Right now, overall, international programs are one of the least popular things in Congress. The exception is global forestry including deforestation, global warming, and biological diversity. The 1992 UNCED Conference in Rio de Janeiro reinforced this need.

HKS: The president is going to give away one hundred fifty million dollars for it.

REB: For global forestry. As I read this message, one part of the international programs, forestry and natural resources, are currently in favor. What the implications are for the Forest Service, I don't know. About the volatility in international programs, let me go back to the Renewable Resources Research Act of 1978. We wanted unambiguous authority to do international forestry research, because the previous authorizations were vague. I was chairing the meeting where we were drafting legislation for the new bill. There were other people also providing background. The committee decided it should seek clear authorization but with a low-silhouette for International Forestry in that legislation. If you read the paragraph about International Forestry you'll see some vague references to the fact that the bill authorizes cooperation with industries, universities, foreign governments, and so forth. What we wanted to do was have the authority but with extremely low silhouette so it didn't provide a hang-up point in congressional deliberations. If I

were to write new legislation today I would give it high visibility, but it was a risky approach in 1977 and 1978.

HKS: What's the timing that put last year as the year to create the deputy chief's job in International Forestry?

REB: It was a consequence of the Farm Bill of '89, the most recent authorizing legislation for both agriculture and forestry. One title in the farm bill had to do with forestry. If memory serves me correctly, that's what created an independent international forestry program in the Forest Service.

HKS: The Forest Service has been involved in international forestry for a long time, but there was some threshold that was crossed.

REB: Yes, this was an important threshold. As I understand it, the chief congressional support came from Congressman Vento of Minnesota. His staff assistant, Jim Bradley, who's a forester, came from the Forest Service. Vento went to Puerto Rico, met with Frank Wadsworth, and was taken up with Frank's charm and ability. Vento became very much interested in international forestry. So that was the congressional side. On the constituency group side, Warren Doolittle, who's now heading the International Society for Tropical Forestry, and other groups lobbied for more visibility for International Forestry. That's how it came about as I understand. Others can comment in more detail about how that came into being.

HKS: I'm going to be interviewing Frank later in the year. He sent me this huge resume, thirty-five or forty pages, very detailed. He visited, officially, about thirty different countries. How was Frank a part of International Forestry? You said you were down to six people in International Forestry, but you had a bunch...

REB: We had six people in Washington, D.C. We also had small programs in Puerto Rico, Hawaii, and the Forest Products Laboratory, plus cooperation with Mexico and Canada at several stations.

HKS: Frank would have been an important part of that.

REB: Yes, Frank and the Institute of Tropical Forestry under the Southern Forest Experiment Station. The appropriations for Puerto Rico, Hawaii, and FPL came out of the regular budget.

HKS: Puerto Rico is tropical, and because of the language situation, it's easier to disseminate something in Spanish in the Third World.

REB: Exactly. Puerto Rico was always important in the Forest Service scheme of things because it was a window to Latin America. The institute had Spanish speaking skills, and I'm told the second largest tropical forestry library in the world.

HKS: Where is the largest?

REB: Oxford University. For me, separating Research from International Forestry as a separate deputy area would have been difficult because I was fond of both jobs. But on balance, I think that breaking it out as a separate deputy area is a good idea at this time. I'm not sure how durable it will be because the total Forest Service budget for International Forestry today is in the twelve-fourteen million dollar range. That compares to one hundred fifty million dollars in Research, one hundred or more million dollars in State and Private Forestry, and nearly two billion dollars in NFS.

HKS: A station director has a larger budget than International Forestry.

REB: Yes, and when one of those inevitable efficiency issues comes around, they're going to ask why do you have a fourteen million dollar program with a separate deputy chief. So the Forest Service will undoubtedly be called upon to defend that program.

HKS: I assume that Sirmon's hunting license is to make it grow and make it permanent.

REB: He probably will do that, but the main influence of that program is going to come from its leverage on other programs. A better way to say that is that the technical skills needed for international work resources resides not with the Forest Service, but with its university and state and private cooperators. But USAID and the State Department are going to have one hundred fifty million dollars from Bush's initiatives. How are they going to spend the money? They are already calling on the Forest Service for ideas. So it's the leverage the new deputy chief can assert that probably represents his greatest potential impact. (This exchange occurred before President Bush's defeat in 1992.)

HKS: Five years from now that money is going to be gone. I'm assuming that one of Sirmon's responsibilities is to make a permanent program out of this and not soft money from the president.

REB: I have the impression that Jeff sees it in that way more as a catalytic role than as a full-fledged operating program with a large budget. I know that's the way I would view it. But just think of the influence that the program could have. The World Bank is a major contributor to the international forestry programs. UNDP located in New York has another major forestry program. USAID, I think they had a hundred or so million dollars in forestry, even before Bush's pronouncement. So that's where the money is.

HKS: That's right.

REB: But the skills are in the Forest Service and its partners.

HKS: And there is a precedent for the Forest Service carrying out these other assignments, like for AID.

REB: So international forestry programs, with the support of AID and some people in both the Forest Service and AID began to grow. One of the things that I did early on was to invite Nyle Brady, senior administrator of science and technology, Jack Vanderyn, Jack Sullivan, all of USAID to join in some round table discussions with Max Peterson. Max was very willing to join in those discussions. I think these informal meetings had a very positive influence on the working relationships with USAID. The second aspect of International Forestry began to develop about the time when I became a member of IUFRO's executive board, and especially in 1981 when I became vice-president. IUFRO was searching for funds to do a series of research problem analyses around the world, and USAID was very supportive in underwriting some of those. In fact, so much so that we invited Nyle Brady to be a keynote speaker at the Ljubljana IUFRO Congress in 1986, and that was another reinforcement in working with USAID. I do want to talk about the IUFRO connection in a little more detail. But it was closely linked to some of our developments domestically.

HKS: You talked earlier about Research's outreach. What did the forestry deans think about International Forestry? Some schools are strong in international forestry. N.C. State is.

REB: The short answer is generally positive--Yale and the Universities of Washington, Minnesota, N.C. State, and many others. Essentially all of them have international forestry programs of one sort or another. Here at the College of Forestry in Corvallis, about 40 percent of our graduate enrollment, and this is one hundred sixty students, are from other countries. Oregon State is not nearly as active as some of the forestry schools. But international forestry is a part of virtually

every curriculum. The Council of Forestry School Deans and leaders has a committee on international forestry. The Peace Corps

HKS: There's a lot of interest by the American students at the Duke School of Environment on international issues. These are the popular courses; save the tropical rainforest and all of that. Are there jobs for First World people? If you graduate today in America with a specialty in international forestry, what can you do? I understand you can train a Third World person to go back and do a job in their own nation.

REB: The employment prospects for forestry are really not very good. I'm confronted with that question almost weekly here at OSU. Both American and foreign students ask, "Where can I go to work?" The problem is not that the need isn't there, the problem is the budget deficit. The most meaningful way for young people to enter into that arena is through the Peace Corps, which is eager to have foresters. I encourage young people to consider that route. It's a tough life, but it gives a person two or three advantages. One of them is a language skill, sometimes more than one language. And the second one is that it gives them cultural and technical exposure to a country or region of the world. A third advantage is that they have some employment rights that go with the Peace Corps assignment. The Peace Corps right now is far and away the most attractive employment possibility. It's a tragedy, so much interest, so much need, and so little opportunity.

HKS: I was wondering about the students who want to work in the Third World, but at First World salaries.

REB: It's difficult. But you know the Peace Corps has been around for long enough that earlier participants are beginning to occupy middle and upper-level management positions both in public and private pursuits. Dave Harcharik, who's assistant deputy chief in International Forestry, is a Peace Corps graduate. The interesting thing to me about the Peace Corps volunteers is that life is never the same after they return. Have you noticed that among Peace Corps graduates? They view the world differently. The Peace Corps is providing background and international skills for the U.S. much the same as the colonial services did for Britain and France.

IUFRO Executive Board, 1976-1981

HKS: You've been talking about IUFRO and how it's related to international forestry, so let's continue on that. Tell me more about IUFRO involvement and its significance to forestry research.

REB: As I've said before, I came into Washington in 1975 and was appointed deputy chief in 1976. I was elected to IUFRO's executive board at the Oslo Congress in 1976. That began what turned out to be nearly a twenty year involvement with IUFRO. It strongly reinforced and fortified my interests in international forestry. My first executive board meeting was in Nigeria, hosted by Domonic Iyamabo, one of the IUFRO executive board members from that country. I was to visit with Domonic many times over the next fifteen years. It was in 1976, and I must say that perhaps was the most significant international involvement I had up to that time. It's the first time that I'd really seen tropical forests with all their forestry problems, including economic and social consequences. The president of IUFRO was Walter Liese of Germany, another person I came to know well.

HKS: I know him a little bit.

REB: Liese appointed me to the Finance and Planning Committee of IUFRO, which really was the inner committee of the Executive Board. I had a couple of jobs at that time. One of them was that I was chairman of the Honors and Awards Committee, which is a fairly significant one. I also was involved in monitoring the administrative activities of the Union, including the secretariat in Vienna. Administrative Problems

REB: The story of the secretariat is a complicated one, and I won't go into it at this point except to say that IUFRO moved its secretariat from Rome with FAO to Vienna, Austria, in 1971. Liese was having serious problems with the secretariat including questions of performance and confidence. I couldn't tell at that time whether this was a conflict resulting from Liese's Prussian and Teutonic tendencies, or whether it was the Austrian tendency toward laissez-faire. But Liese talked with me about it repeatedly. One also has to understand that one of Liese's sons was dying with a long term illness, a brain tumor. And so Liese was under great stress, and he involved me in some of the administrative chores of the Union. The question of the secretariat for IUFRO remained until I became president in 1986.

HKS: Right.

REB: A second issue came up during that time, for which I was more an observer than a player. It was the China problem. The People's Republic would never accept Taiwan as a separate country. For that matter, Taiwan wouldn't accept mainland China. I remember that Liese and Tai Satu, the vice-president from Japan, developed an accommodation that gave representation on IUFRO principal governing body, the international council, to the People's Republic of China. They also worked out an arrangement where Taiwan, the Republic of China, would have observer status. It was a tender, fragile relationship, but at least it avoided confrontation at the Kyoto Congress, and it carried in a very uneasy way up until 1990 during my presidency. I want to come back to that. In many respects this first term on IUFRO Executive Board was a precursor for problems that I would address later on. Liese was serving as a treasurer for the Union. His office was sending bills to many countries of the world, and with currency exchange problems, delinquent dues, and all of that, an incredible workload developed.

HKS: Because the secretariat wouldn't do it?

REB: Because the secretariat couldn't or wouldn't do it. At that time levels of trust also were low. The secretariat was handling IUFRO news and some routine membership questions, but the treasury responsibilities stayed with the president. Liese and I had some discussions about Union finances. Amy King of the Forest Service, who served as an assistant to George Jemison when he was president of IUFRO, said, "Why don't you appoint a treasurer?" And I asked myself, why didn't I think of that? So Liese and I talked about creating the office of treasurer, a shared perception, I believe. So late in my first term, we proposed the creation of the office of treasurer. We had preliminary discussions with a very able research administrator from Switzerland, Walter Bosshard, who was director of the Forestry Research Institute of Switzerland. Walter was willing to take on that job. Furthermore, as director of the Swiss Institute, he volunteered to underwrite the costs of the office. The incoming president was Dusan Mlinsek from Yugoslavia. Yugoslavia, was a soft currency country and didn't have a reliable banking system. Mlinsek just didn't want to have anything to do with the office of treasurer. So office of treasurer with Walter Bosshard as treasurer was timely and has worked out well. This brings us then to the Kyoto conference of 1981, which was hosted by the Japanese. Special Program for Developing Countries

HKS: I went to that one.

REB: Then you know what an outstanding event that was. At the Kyoto Congress, John Spears of the World Bank and Marco Flores Rhodas, assistant director general of FAO for forestry, presented a paper to IUFRO which said essentially--why doesn't IUFRO bring its resources and skills to bear on forestry problems in the developing world. There were some discussions following the paper--in the end, IUFRO accepted the challenge. In the meantime, I was elected vice-president of the Union which involves chairing the program committee. At our first executive board meeting following Kyoto, I was asked to take the lead on the challenge from the World Bank and FAO. I must say there are very few assignments that I relished more than that one. I prepared a position paper suggesting how IUFRO might respond. We called a special meeting of the Finance and Planning Committee (a small policy subcommittee of the Union) in Vienna in March 1982. At that time, the Executive Board agreed with my assessment that we couldn't

handle this assignment on a volunteer basis, that we needed to have a person to give our leadership to the developing countries program. We agreed that we would advertise globally for that position which had financial support from the World Bank. There were about fifteen or twenty applicants. The Finance and Planning Committee met again in Zurich in November, as I recall, to assess where we were. We went through the list of candidates and the work load, and we agreed to recommend to the full board recruitment of Oscar Fugalli. Oscar Fugalli had recently retired from FAO in Rome where he occupied a senior position in their forest resources department as a silviculturist. We agreed that to recommend Oscar Fugalli as coordinator for the Special Program for Developing Countries, SPDC, to the full Executive Board. I had some ideas about what the SPDC would do, and so did Oscar. I wanted to put the early emphasis on problem identification--what are the problems in the developing world for which science could make a substantial contribution? I didn't want to start with organizational questions to assess researchable problems. That began a series of workshops involving Asia, South America, and Africa underwritten by, among others, USAID, World Bank, and UNDP. In fact I think there was something like ten or twelve donors that ultimately helped underwrite the ten workshops. The purpose of these workshops was to ask what are the most important problems that we ought to be addressing, with as much input from the scientists from the region as possible. The first workshop, held at Kandy, Sri Lanka, was concerned with multipurpose tree species suitable for the Asian/Pacific region. We came out with a planning document with Keith Shea and Les Carlson of Canada doing the secretarial tasks. Oscar Fugalli was at this workshop and assumed increasing responsibility for others to follow. We held another similar workshop in South America and two more in Africa all aimed at multipurpose tree species. For Africa, one was concerned with the sub-Saharan region; and the other for the southeast Africa Division Five, under the leadership of Bob Youngs, took on the question of problem identification for utilization research in each of the three continents. An eighth planning document, this one in cooperation with the International Food Policy Research Institute, addressed natural resource policy questions.

HKS: What did you do with these problem analyses? INCOFORE

REB: As we moved into these regional problem analyses, we began to ask: what kind of an organization do we need to strengthen global forestry research in the developing world? All of us were very much aware of what agriculture had done with the big international research centers, and we wanted something like that for forestry. It was time to deal with the organizational questions. I prepared a paper for the 1986 Ljubljana Congress where I outlined a concept called INCOFORE, International Council for Forestry Research and Extension. I wanted to use these problem analyses as a basis for the organization.

HKS: Are those analyses well distributed? Do most forest school libraries have them?

REB: No, I don't think most forestry schools do.

HKS: It's a fascinating document. I wonder who has access to it.

REB: They've been sent to donor agencies, and they're available in limited numbers from the IUFRO secretariat.

HKS: Small press runs.

REB: Let me give you a later paper which describes in detail what we did and the origins of this program. I think it's an important reference document. (IUFRO. 1989. *INCOFORE: A Research and Extension System for Tropical Forestry*. 35 pp. IUFRO Secretariat, Seckendorf-Gudent-weg 8 A-1131 Vienna, Austria)

HKS: Thank you.

REB: INCOFORE was an organizational concept to serve as a starting point for forestry research on high priority topics in Asia, in South America, and in Africa. These contributed to discussions that were also underway among other major players. Bellagio Conferences

REB: About this time, FAO, the World Bank, the World Resources Institute, and UNDP were trying to stimulate interest in global forestry, including not only research but also action programs. There were two parallel efforts underway. One was called Tropical Forests: A Call for Action sponsored by the World Resources Institute, UNDP, and the World Bank. Another was the Tropical Forestry Action Plan (TFAP) under development by FAO in Rome. Both were to look at overall global forestry, of which research was a part. The TFAP was issued in 1985, and it was soon merged with the World Resources Institute effort into a single program called TFAP. The Tropical Forestry Action Plan was a high visibility program. It was obvious that forestry research had piggybacked on that process. The TFAP served as a basis for a conference on global forestry at the Rockefeller Conference Center in Bellagio, Italy, in 1987. Bellagio was very significant because it was here that the system of International Agricultural Research centers came into being about 1970. In any event, the conference in 1987 dealt with the issues raised in the Tropical Forestry Action Plan, including research. The Bellagio I conference came out with about ten recommendations, two of which concerned research. A second conference was convened in the U.K., but it was called Bellagio II. This one dealt only with research. Oscar Fugalli and I attended because of our IUFRO connections. There were about thirty or forty donors at Bellagio II, chaired by David Hopper of the World Bank. A task force proposed several alternatives to the participants and recommended paralleling the INCOFORE concept where forestry would be a stand-alone international forestry research institute similar to the then status of the International Council for Research in Agroforestry (ICRAF).

HKS: What happened next?

REB: The Bellagio II conferees, very senior people, rejected the stand-alone institute and said instead we must consider forestry research for incorporation into the CGIAR system. CGIAR, Consultative Group for International Agricultural Research, consists of about forty donors that underwrite the International Agriculture Research Centers, a two hundred fifty million dollar a year undertaking. They didn't reject many details presented by the task force, but they said you need to be in the larger agricultural research system. From my point of view, this was a much more favorable outcome than we had dared to expect.

HKS: What happened to IUFRO's role after the CGIAR group accepted forestry research in its mandate?

REB: In many respects the action was taken away although IUFRO was never the sole player in the game. And as deliberations moved forward, the action shifted more to the CGIAR group. The donors indicated about 1990 their intention was to incorporate forestry research into the CGIAR system. Actually deliberations went on for another two or three years before forestry research was formally accepted into CGIAR. One of them was ICRAF, International Council for Research in Agroforestry, located in Nairobi, Kenya, but now with global rather than African mandate. The second, now named CIFOR, Center for International Forestry Research, to be located in Asia. ICRAF would handle agroforestry research and CIFOR most other forestry research. Small parts of forestry research, such as policy and plant genetic resources, would be dealt with in other of the existing CG centers. Australia was appointed as the executing agency to bring this new entity into being, and we're now in the final stages of those deliberations.

HKS: Rockefeller's supporting it and other foundations.

REB: There are forty governmental and foundation donors. The story of the CG system is a great one leading to the Green Revolution in wheat and rice. It's the place where forestry research always wanted to be. If I were ten years younger I'd have my hat in the ring for the director

general's job of that new forestry research institute in Asia. IUFRO was a significant player in this achievement, but like all victories, you know there are dozens of fathers.

HKS: Let's follow up on what you just said that forestry now is positioned where it always wanted to be in this structure.

REB: Forestry research.

HKS: Forestry research. I don't completely understand the significance of what you said.

REB: It's significant for several reasons. The International Agricultural Research Centers (IARCs) are the premier research institutions to approach agricultural problems in the developing world. Forestry joins that group. Because the IARCs are so visible and they've done so well, they're the recipients of major funds, two hundred fifty million dollar a year for the thirteen centers then in existence. There is no funding source anywhere in the world to equal those. What that means is that some of the individual institutes have annual budgets of more than twenty million dollars a year, rice, wheat, and so forth. You know that Norman Borlaug won the Nobel Prize for his work on wheat, and that's the family of institutions that forestry joins. The system has been enlarged to eighteen institutions now, two of which are forestry, ICRAF and the one yet to be located in Asia called CIFOR, Center for International Forestry Research. The role of the international centers is to do upstream or more basic research. They address the more fundamental obstacles to greatly increased production of x, you name the commodity. They do the pioneering work, generally beyond the capacity of developing countries. Forestry obviously has an equivalent role in that kind of research. Some of the early problems tentatively identified for the forestry institutes include genetic improvement, seed source studies, tree breeding, husbandry techniques including fertilization and insect and disease protection, irrigation or drainage, and whatever else is required to impose the performance of tree crops. It's the ecological equivalent, really, of what has happened in wheat and rice. You can imagine that tree species involved are going to include some of the pines of North America, eucalyptus of Australia, and acacias from several places in the world. Other things that have been identified as obstacles in forestry include soil relationships, including mycorrhizal studies, other soil symbionts like bacteria and things of that sort, and nutritional requirements. Still another area tentatively identified for accelerated research is utilization. One of the quickest payoffs is to use wood more effectively to make it last longer and burn it for cooking and heating more effectively.

HKS: In our Costa Rica conference it was debated heatedly, but nothing was resolved; is a country like Costa Rica better off in a real market that creates value? Some people say then you deteriorate the rain forest or chop up these marvelous tropical hardwoods to make boxes to ship fruit in, and the farmer doesn't get any money out of it. The debate was, is the Third World better off isolated, or in the real market? Will they receive the true value in economic terms of that unique commodity they have or are we screwing them over so that we can have hardwood trim on our new floors and so forth. Utilization is really a contentious issue.

REB: I'd like to discuss that issue with you, maybe over a cocktail. The points that I want to make are that IUFRO was given the charge for special programs for developing countries, the job was given to me as vice-president in 1981; it was an assignment that I relished. When I became president of IUFRO in 1986, I didn't surrender that job, I kept it. Now I think maybe that brought about some resentment in the executive board, but I was so intrigued by that program that I wanted to keep it.

HKS: When you say utilization, will this generate work for the Forest Products Lab?

REB: It could. Even without the new international forestry research center, FPL was and is playing a substantial role in forestry utilization around the world.

HKS: This is a change of direction for IUFRO, which historically has been a gathering place for people.

REB: That is correct. And this was a major concern to some members of IUFRO's Executive Board during the early years of SPDC, who wanted to keep the SPDC entirely separate from IUFRO regular programs. Ironically one of the later criticisms was that the SPDC was not integrated sufficiently with the regular program.

HKS: But no action plan. Now here IUFRO is putting all of its talent, taking advantage of the talent it has and solve a world problem, directly.

REB: Yes, to all of the above. We knew that the traditional way of doing IUFRO business, very much voluntary--you came, you participated, you brought your own travel funds and so forth--that simply wouldn't work in the developing world. IUFRO, and especially some of the European members of the Executive Board, were very hesitant about this departure from the traditionally IUFRO role, as you can imagine.

HKS: I'm sure.

REB: But there were enough supporters at those two meetings, one in Vienna and one in Zurich, that the board hesitantly said go ahead with your proposals for a special program for developing countries. I must say that today the IUFRO Executive Board and others in IUFRO who are familiar with it are proud of what the Union has done, and they don't want to relinquish this program under any circumstances.

HKS: You're still involved in it?

IUFRO Presidency

REB: More now as an observer than as an active participant. So this was a major development during my time, and this concept has been endorsed by the IUFRO Congress in Ljubljana and strongly endorsed and reinforced again by the IUFRO Congress in Montreal. Permit me to backtrack for a moment. My vice-presidency ended in 1985, and then came the question of who would be the next president of IUFRO. Early on, I had no special interest in being the next president of IUFRO until I became so involved in the SPDC. I began to ask myself, can I have more influence on this program as a president than otherwise, and of course the answer was obvious. So I announced that I wanted to be a candidate for the next president of IUFRO. I know that there were folks that were unhappy about that. Walter Liese was one. There was the issue that I was American. After all Jemison had been the president just a short time before. A nominating committee was appointed. The other candidate was Walter Bosshard who was director for the Forestry Research Institute in Switzerland. Walter and I agreed that whoever was elected, the other would support fully. I am told that the Nominating Committee noted the presidency of IUFRO had been in a German speaking country for several terms and that the Union had only one president outside Europe, and I received the nomination. The International Council approved. There were a lot of things that I could do as president that I couldn't do otherwise. Although Fugalli and I tried to keep board members informed, I think some may have been unhappy because they thought we kept that work pretty close. I was in weekly phone contact with Fugalli in Vienna about fast-moving events, but the board met only once a year. In any event Fugalli and I left our jobs late in 1990, he to be succeeded by Loren Riley of Canada and me by Salleh Mohammed Nor of Malaysia as president, with overall supervising of the SPDC to Jeff Burley of the U.K. who was incoming vice-president for programs. The Secretariat

HKS: Earlier you mentioned problems with the secretariat in Vienna. Could you elaborate?

REB: It became obvious to me in the 1980s that the secretariat in Vienna was simply not functioning well, and in fact was in decline and that the concerns that Liese had a few years

earlier were genuine. Our secretary at the time, Otman Bein, knew that there was a lot of concern about his performance. I suspect that he felt that he had a mentor in me who would encourage his continuation. We had known each other socially and on two occasions we hunted together in Austria. In the meantime Bein had a serious accident. Both of his arms were in casts. He knew then that I was a candidate for the presidency, he wrote me a letter and said that because of poor health he was contemplating retirement or resignation from IUFRO. And I am almost certain that what he anticipated is that I would come back with a letter and say we can't spare you. I wrote to him saying that his first consideration was to his health and to his family and that we would accept his resignation. I knew I had to do something about the secretariat, so he made it easy for me. And we, with the assistance of the Austrian government, replaced him with Heinrich Schmutzenhofer. Heinrich has provided all the qualities of leadership and vision needed for IUFRO's continued growth. It was never a question about the previous secretary's dedication to the Union, it's just that events and times passed him by.

HKS: Now Jemison had been president, Harper had been vice-president, so there wouldn't have been any eyebrows going up in the Washington office of all this extra duty you'd taken on. Some people could say, well you ought to deal with the Forest Service. But the precedent had been well established, so in terms of the agency, there was no problem, you being president of IUFRO and very active.

REB: No problem at all. In fact I think encouragement. I announced in mid-1985 my intention to retire early in 1986. But before I was elected president of IUFRO in 1986, I visited with Max and Dale Robertson about post-retirement support for my IUFRO activities. There never was any question. I drafted a letter for Max's signature and got Dale's approval on it saying yes, we will support your office and travel expenses during your time as president, and we will also support your past president's costs. The Forest Service has been unstinting in supporting those out-of-pocket costs. Otherwise all of IUFRO's activities have been done without compensation. I was a volunteer.

HKS: What authority does Max have to make that agreement? Are you part of a volunteer program?

REB: Yes, I am. While I am unsure of any other specific authorities, the Forest Service frequently uses its funds to support work that furthers its aims at strengthening domestic and international forestry.

HKS: The Forest Service has paid my way to go to certain meetings as a volunteer.

REB: They provided me office services (pointing to this building); they provided me secretarial help and office space and things like that. But I think over that four year period I probably gave half my time to IUFRO activities, and I still give a quarter...

HKS: So your office in this building is because of IUFRO, not because of deputy chief emeritus or something.

REB: Primarily. I also have an office in Peavy Hall where most of my teaching responsibilities are met. To finish IUFRO administrative issues during my presidency. The treasurer and the secretariat were by now fairly well taken care of. Understand that Liese's presidency to mine, membership doubled, going from seventy-five hundred individual scientists to fifteen thousand. By 1990, one hundred six countries and seven hundred research institutions were members, so the workload was growing enormously. When I became president, I wanted to gather up all the administrative activities in the Union, which were scattered among various members and committees of the Executive Board, so I asked Jim Cayford of Canada to serve as the chairman of the administrative activities of the Union. Keep in mind that at that time the vice-president was in charge of programs. The six divisions and the sixty subject and project groups were under the overall guidance of the then vice-president, but the administrative side--treasurer, secretary,

publications, and dues--really didn't have any counterpart. I asked Jim Cayford to take over the leadership of that cluster of activities so that it would give me as president more time to be involved with both committees. Jim took on that job. But what I was really aiming for was a second vice-president of IUFRO. We proposed this to the International Council at the Montreal Congress and they approved. And so a second vice-president was created. One dealing with the administrative affairs of the Union and the other dealing with the scientific affairs. That's the organization today. The president today is Salleh Mohammed Nor of Malaysia, assisted by Jeff Burley, vice-president for programs of the U.K., and Jim Cayford of Canada, vice-president for administration. The China Problem

REB: By way of summary, what I'm recounting here are the administrative and organizational changes of the Union that were addressed during my time as president. Let me touch on a couple of other issues in IUFRO. One was the China problem. Keep in mind the non-political, non-governmental nature of IUFRO, and it all came to a head in conflicts between Taiwan (ROC) and mainland China (PRC). I mentioned earlier that Liese and Satu had found a temporary accommodation to the China problem, but in the meantime Taiwan was getting restive as hell. Taiwan actually has more IUFRO participants with its twenty million people than China does with a billion people. I recalled reading several years ago, in a foreign affairs journal, a discussion of the conflicts between People's Republic of China and Taiwan. You know this has been a bitter debate over the years. That foreign affairs paper mentioned only one exception where PRC China recognizes Taiwan, and that's in their joint affiliation with the International Council for Scientific Unions, ICSU, located in Paris. ICSU had developed an accommodation by which both Taiwan and China could be represented in the same international bodies. Somehow that stuck in my mind. So as we were headed for a confrontation, China wanting to expel Taiwan from any administrative role in IUFRO, I recalled the ICSU precedent. I said, the solution here is for us to adopt the principles of ICSU, which provides a home for scientific unions all over the world, and IUFRO was one. So we recommended to the international council in Montreal that IUFRO follow the rules of ICSU, and they adopted it. I think it would have been interesting for you to sit in on the debate.

HKS: I'm sure.

REB: The secretary and I met with representatives of the two Chinas in Montreal, and I thought we had an agreement about how to resolve the matter. PRC China would hold the seat in the current International Council meeting in Montreal but that both Taiwan and mainland China would sit at the table in the next International Council meeting, in keeping with ICSU's procedure. PRC China obviously came to Montreal with instructions from their government that under no circumstances would Taiwan sit at any table or be a co-equal with PRC China.

HKS: At the Fifth World Forestry Congress in Seattle in 1960, I was McArdle's chauffeur. The Forest Service sent me to Seattle because I knew my way around. He was having all these problems. They had a Friendship Grove for sixty-four nations. And some country, let's say Czechoslovakia, had a brand new flag, but no one knew it. The United States government presented them their old flag to carry in the parade, and they were upset. I imagine in IUFRO you have the same problem.

REB: A parallel situation, in both cases the implications are far more significant than whose flag flies or who has a seat at the table. I remember a big ceremony where one flag was marched out of the arena and out of the display area. I can't remember but it could have been the Taiwan flag, so these international protocols are extremely sensitive. In any event, the PRC delegate challenged these arrangements in the International Council meeting, contrary to what I thought was a prearranged agreement. I didn't want to have a public debate, but finally we did. As chairman of the council, I took a fairly active role and explained the circumstances and what the alternatives were, and I was terribly concerned that the ICSU precedent was going to fail. But when it came to vote, it was fifty-five for the position that I was proposing and one opposed.

HKS: You mentioned the larger significance of the debate. Could you explain?

REB: The China question in its own right is a major one in terms of international relationships, but the larger significance of this is that it was a powerful and dramatic reaffirmation of the non-governmental, non-political role of IUFRO. One has to think about it for a moment, but that's an important point in international relationships, and it served IUFRO extremely well. IUFRO enjoyed, for example, East/West and North/South contacts, because it was non-aligned and non-governmental in nature. IUFRO could move easily between western Europe and eastern Europe and the Soviet Union. There are many other examples about how critical it is for the Union to be non-political and non-governmental.

HKS: The history group put on a conference in Zwolen, Czechoslovakia, about three or four years ago. Someone you may know, Dariosh Voshmgir, was there to represent the secretariat.

REB: Dariosh? He is an Iranian working in Vienna.

HKS: I guess you know him pretty well. We stayed at his hotel when my wife and I went back to Vienna with him. When we were driving in Czechoslovakia he showed us his passport. Because of IUFRO he had some sort of generic passport, it was almost like being a member of the State Department or something. He didn't have to worry about visas and border crossings the way all of us did. I thought, isn't that interesting that IUFRO has enough stature that he could enter and leave the East Block, which in those days was petty damn hard to do without a lot of rigmarole when you're driving. My esteem for the organization went up a notch. Gee, this really is recognized as a significant body.

REB: Yes, it is. It gives a legitimacy to inter-country interactions that often could not be achieved governmentally. The irony is that many governments recognize that they need this kind of body to carry out their business. For example, the U.S. government tends to be very supportive of IUFRO activities because it fulfills a need that governments can't meet. But it came to a head on that China question and there was, I think, a substantial reaffirmation. An additional significance of the two China debate was that it gave us a generic mechanism to deal with shifting alliances among and within countries under a wide range of political circumstances. Latin America

REB: Now a couple of other things that came out of my presidency. I very much wanted to draw Latin America more into IUFRO. Latin America was the most reluctant continent of any, and IUFRO has more trouble in Latin America. We, with the help of our Spanish representatives, were now publishing IUFRO news in Spanish, the Spanish are doing it, and we adopted Spanish as a fourth official language of IUFRO.

HKS: I want to ask you one question about Spanish. Since Spanish is not a traditional scientific language, was there any reservation to do that.

REB: Spanish imposes some additional costs on IUFRO. IUFRO still conducts most of its business in English. And so, informally, English still serves as the principal working language, even in Spanish countries. Still, if we wanted to reach Spanish-speaking groups, both in the new and old worlds, official recognition of Spanish was important both for its substance and its symbolism.

HKS: Right, when we put on our conference in Costa Rica, we had money from Rockefeller. They said, you have to have someone to do translation. We were dealing with the humanities and not with science, and most people there really couldn't speak English very well. It was an interesting experience for me.

REB: A couple of IUFRO research planning workshops were held in Latin America, where the papers and the discussions were in Spanish.

HKS: It was more a courtesy. You go into someone's country, you've got to speak their language.

REB: Absolutely, but informally, English still is the principal working language of the Union.
Extending IUFRO Cooperation

REB: One of the things I wanted to do with IUFRO had a parallel with what I was trying to do domestically, and it was to build bridges and to enlarge the groups that deal with forest sciences. In this regard I asked that an Executive Board meeting be held at the headquarters of FAO in Rome, I think in 1987. The relationships between FAO and IUFRO had been uneasy for a long time.

HKS: I know.

REB: I wanted to say IUFRO cares. I think that meeting had a fairly positive outcome. I also wanted to use IUFRO to symbolize East/West relationships, and early in my presidency we arranged for an executive board meeting that would be split between Vienna, which was then western Europe, and Prague, which was eastern Europe. It was to show these joint relationships. Wouldn't you know it, about six months before the meeting came off, the Iron Curtain collapsed. [laughter] But that didn't detract at all from the joint meeting venue. As symbolic bridge building, it worked out as well that the Iron Curtain was down. It just changed the nature of the discussions. Several leaders of forestry research in eastern Europe, the USSR came, including Alexander Isaev who was then chairman of the State Committee of Forestry for the USSR. He spent the whole week with us. Now Isaev is a scientist in his own right, he's an entomologist and has written several books on entomology and was active in IUFRO before Gorbachev appointed him as chairman of the State Committee of Forestry, a ministerial level post. So that bridge building meeting worked out well, and IUFRO has now adopted a practice where we try to have a split venue in meetings. We'll meet in, say Chile, but we'll visit Brazil before we go to Chile. Or, we will meet in the Philippines, but we'll spend a couple of days in Taiwan. What I was trying to do was extend the reach and the concerns of IUFRO.

HKS: When you say you'd stop like that, the few times I tried to arrange stops in international travel, the costs went through the roof. It's cheaper to go here to Hong Kong and back and here to Tokyo and back than it is to go from here to Hong Kong to Tokyo.

REB: I don't really know how this played out. For me, I don't think it made much difference.

HKS: It's significant enough. Third World travel outside the U.S. is complicated, because the air fare structures are so much different than ours.

REB: Americans can hunt around and find fares that nobody else in the world can match.

HKS: That's right.

REB: In terms of bridge building, in 1988 or 1989, the Executive Board was scheduled to meet in Beijing. We were going to stop over in Taiwan before we went to Beijing and had to go through Hong Kong in order to get our visas cleared. But Tiananmen Square conflicts intervened, and most of the board would not have come to Beijing because it was such an anathema to what people believe. So we still went to Taiwan unofficially and then on to the Philippines for that formal meeting, but it was another example here of trying to cast a larger shadow for IUFRO.
IUFRO and Global Science

REB: I have tended to deal with administrative and organizational questions in this discussion, but we need to keep in mind that for IUFRO these are only means to an end. The real reason for IUFRO's being in place is the extension of science, to share results, to cooperate, to anticipate the next generation's problems. IUFRO is a robust organization. As I said earlier, there are more than sixty subject and project groups many of which have working parties beneath. More than

fifteen thousand scientists are affiliated with the Union. As of a few months ago about one hundred six countries, but there are going to be more now that the Soviet Union is breaking up into separate countries. The reason for IUFRO's existence is not administration, it's to provide a forum for the exchange of science. It's a networking organization, and I'd guess I'd like to think it's been very successful.

HKS: It's certainly broadened my horizons, I've gone to more than a half dozen.

REB: During my four-year presidency, there was something like two hundred symposia, workshops, and colloquia held in various parts of the world, dealing with the subject content of IUFRO, about fifty a year. Fifty percent of those workshops and meetings were held in Europe, 25 percent in other industrialized countries, and about 25 percent in the developing world. I think this is a partial manifestation of IUFRO's growing interest in developing countries. I suspect that in the next term of Salleh's presidency, a still larger proportion of these will be held in the developing world.

HKS: Bob, do you want to add some additional comments on IUFRO?

REB: I'd like to conclude our discussions on IUFRO with a few impressions that occurred over those eighteen years with which I've been associated with the group. The first one concerns the globalization of IUFRO's efforts. Prior to World War II, IUFRO was very much a European organization. The U.S. was there in observer status, but not terribly active. After World War II, IUFRO was reconstituted, and the U.S. and other industrialized nations began to participate. Les Harper was the vice-president, George Jemison was the president, Tai Satu of Japan was a vice-president leading up to the Kyoto Congress. But still, in those early days, Europe was the dominant guiding influence on the Union. I became president in 1981 and in 1986 the second president from other than Europe. But by that time other regions of the world, North America, Canada and the U.S. in particular, Japan, Taiwan, were becoming much more active. At the time my presidency ended in 1990, 28 percent of IUFRO membership was from Europe, 28 percent from North America, about 14 percent from Asia and the balance from the other continents of the world. I was followed by a non-European president also, by Salleh Mohammed Nor, who's the first from a developing country. The point that I'm making here is that Europe was the major influence in IUFRO until sometime after World War II, but they've created a robust group of children, and IUFRO has really become global in outlook. I think Europeans view this with some ambivalence. They hate to see their children leave home, but they're also proud as can be of what they've created, and I think properly so. Another observation concerns the subject matter content of IUFRO. Very much development oriented--silviculture, watershed, genetics, and things of that sort--until recent years, but with a growing environmental content in the program. Concern about air pollution, biodiversity, ecosystems studies, and topics that wouldn't have been very germane fifteen or twenty years ago. The Union has responded in many ways. I should also point out that the things that are not directly research-oriented but otherwise support forestry have been enlarged and they include your own activities, forest history, library services, computer sciences, and a whole set of facilitating and supporting activities for science have become a major part. IUFRO has also extended its scope substantially. There's now a very active boreal forestry group, and the tropical groups. In fact there are many tropical groups, and this would have been unheard of only two or three decades ago, so IUFRO has really expanded in many directions.

HKS: I'm assuming that the SAF meeting in Fairbanks in '94 with the theme of boreal forests will have a substantial IUFRO connection.

REB: I presume so. Okay, so much for IUFRO. Other Forest Service Activities RPA and Planning

HKS: Do you want to go back and look at RPA in terms of research planning?

REB: RPA at its inception was largely administered by the chief's office and by Max Peterson, the deputy chief for programs and legislation. The roles of research really were two. One was to provide technical backstopping, that is the use of computers and computer programs and algorithms and other technical skills. These were drawn upon heavily in managing the database and gathering information for RPA. Research also was the principal provider of information for the Assessment. So there was a lot of technical support and technical backstopping for RPA. The second aspect was that Research had an important part in RPA because it was one of the programs that was under evaluation and review. As I've said already, we gave a great deal of attention to justification for research, especially early in my time as deputy chief. Now I want to introduce a thought here that may be more important by way of hindsight than foresight. I was terribly uncomfortable in the formative years with RPA and with the National Forest Management Act--data acquisition and data handling were getting out-of-hand. There was far more information available than one could assimilate. My concerns gradually formed into this notion: that we were attempting technical solutions for what were essentially political problems. I've reflected over that many times. That the people recruited to help both the RPA and land management planning within NFMA were some of the best and most able of the Forest Service. They did incredibly well in developing and in fact changing state-of-the-art on the various data gathering and analytical tools. But the issues here, I realize more clearly every year, were not technical, they were political. I keep asking myself, if we were to start over again, if we had had a better comprehension of that, might we have organized the display of the information differently? Might we have acquired data in different ways? Probably in larger chunks so that we could display them more concisely. Did I mention this, that we in research were presented one day with something over fifty thousand options?

HKS: No, I hadn't heard that before.

REB: We were. By the time you take eight or nine alternatives, and eight or ten program alternatives within those, and then build in still other ways, you can generate just enormous numbers of alternatives, beyond comprehension of anyone. Anyway, the principal point I want to make is that had we viewed this as a political process we might have organized and displayed information differently. To its credit, RPA has been slimming down, at least the public displays have been slimming down in more recent years and I find them much more attractive. Research Planning in USDA

REB: Now let me back up to 1982. In 1982 the second Farm Bill was passed, and it broke the science and education groups in the Department of Agriculture into a separate agency called the Science and Education Administration (SEA), and a new assistant secretary was created. This took Science and Education away from the assistant secretary who was also looking after the Forest Service and the Soil Conservation Service. Orville Bentley was appointed the first assistant secretary for Science and Education. The 1982 Farm Bill required the science and education agencies to do for science essentially what the RPA had required for the Forest Service. The 1982 Farm Bill required four things: an assessment of the problems confronting the agricultural and forestry research sector; a five-year plan; an annual list of priorities; and an annual report of accomplishments. Orville Bentley, presiding over the Joint Council for Food and Agricultural Research, asked me to take the lead in preparing the documents to satisfy those legislative requirements. Of course I had help from some very able colleagues and guidelines from the Joint Council. I began with the same perception that I've just given you for RPA and NMFA, it's essentially a political process, not a technical one. I started out by saying that none of these documents were going to be more than fifty pages long, shorter if possible, and the audience is going to be informed laymen and members of Congress. The documents that came out of that process are here (displayed on the table).

HKS: While we're talking about these four documents, briefly summarize how they're significant, in terms of research planning and USDA.

REB: The four documents are an equivalent to the RPA process, that is an assessment, a five-year plan, and an annual listing of priorities for science in the Department of Agriculture. The priorities would be the equivalent of the policy statement that the president is required to send to the Congress under RPA. The fourth document is the annual accomplishments for USDA research extension and education including forestry research. In many respects, this was my way of saying, maybe there's another way to approach the RPA. Let me make another observation in that regard. If you look back on the history of not only Forest Service Research but the Forest Service itself, you'll see a whole series of planning documents, the Capper Report, the Copeland Report, the Timber Resources Review, a National Program for the National Forests, and so forth. RPA in most respects is a later generation equivalent of those earlier planning efforts. My view today is that the next chief of the Forest Service would be well served to put a whole new face on the RPA process, the half-life of the current approach is already past. Now the RPA is required by law, so we can't lose all of the identity to it, but it desperately needs a new approach.

HKS: We hear about the amount of number crunching; each national forest had to come up with a plan. It was a terribly demanding requirement that Congress put on the agency.

REB: I think a lot of these were self-inflicted wounds.

HKS: Self-inflicted.

REB: I remember hearing about running the FORPLAN plan for the Deschutes National Forest. I think the computers ran for thirty hours [laughter] and then aborted.

HKS: Sure.

REB: But you know science has some responsibilities here too. We need not only to develop some of the technologies but we need to offer advice and counsel about the limitations and management of numbers, databases, and so forth, so it's a shared responsibility. Research didn't do as well as it should.

HKS: For RPA, you have to go outside of the agency for the Assessment. You're dealing with a lot of different kinds of data, different parameters. You've got to put it all in a big box and shake it up and come up with an assessment. It's enough to do it for the national forests, but to do it for all lands.

REB: Actually the Assessment had lots of antecedents, and the Assessment was not the difficult part of RPA.

HKS: Is that right?

REB: That's right. When I say we have lots of experience with Assessments, the timber surveys were going on even before the McSweeny-McNary Act of 1928 and the Copeland Report in the early 1930s. And there have been a whole series of timber assessments, each more refined than its predecessor, and each raising more questions for the next one.

HKS: Right.

REB: Now the difficulty with the assessment in the RPA days is that we were required to get information on other resources--wildlife and water and things like that. Those were more difficult, and the information not nearly as mature as it was for timber, so that gave an apparent imbalance to the RPA. Those issues will be corrected as time goes on. The most difficult problem in my estimation came with the program side, and it was generating alternatives among dozens of options. The combinations and permutations became huge. There was a companion problem with the forest plans required under NFMA. That's where new tools like FORPLAN and others came into play. Here too we were generating all of the data that people could gather and computers

would handle. Excessively so in my estimation. The upshot was that the information generated under NFMA for the individual forests could never be very well integrated with the national programs. Consequently, Congress would deal with Forest Service budgets in terms of the traditional line items and not in terms of the plans themselves. Now I know Max wrestled with that question at great length and never came to a useful conclusion, and I didn't help him very much either. But imagine the detail that was amassed for each of the 153 national forests, and this was supposed to integrate upward into that program. You couldn't amalgamate them, so there was a discontinuity between the forest planning and the national program.

HKS: There's been some litigation that has refined our understanding of what the law really said, right?

REB: Oh, is there? I wasn't aware of that.

HKS: Lawsuits over forest plans, and the judge says this plan is not adequate.

REB: I wonder if the inadequacy is based on other legislation than the internal requirements of RPA, for example the Endangered and Threatened Species Act, or the procedural requirements under NEPA.

HKS: I'm not sure. The forest supervisor for the forests of North Carolina is quoted in the press as saying, "We did the best we could but the courts say we've got to go back and do it again." That's the sum of my knowledge.

REB: Those lawsuits are generally based on procedural shortcomings of such processes as the National Environmental Policy Act, NEPA, and the Endangered and Threatened Species Act, and other legislation. Not the internal implementation of RPA.

HKS: Complicated times we live in.

REB: Yes. My concluding observation about the planning in the Science and Education Administration is that Orville Bentley and the deans of the agricultural schools and all of us that participate in the science and education planning would take these documents to members of Congress and to other interested groups. In many respects it quieted a lot of the external concerns. We knew who we were, what our goals were, and how we were going to accomplish them, and we displayed them in a relatively concise way.

HKS: How does this translate to the guy sitting in a field research station in Bend, or Grand Rapids, Minnesota? How is his life different because of this planning process?

REB: Excellent question. In terms of the planning process, not much. Because he already knows what his colleagues and his contemporaries are doing. They generally know where to go with their research program. So this process isn't for them. Detailed planning is not for internal use, it is to satisfy constituencies and the gatekeepers outside the agency.

HKS: Like in financial matters, you leave a paper trail so that the auditor can follow closely what you did. It's the external review process.

REB: This overall process has been repeated many times in the Forest Service to give coherence, visibility, and timely justification to a program for those who can influence its well-being. In one form or another this process is and will be repeated many times over.

HKS: If you don't do that, you don't get the budget so people can do their research.

REB: That's right, that's the way the ability to do the hands-on science is affected. You asked me about the world as a deputy chief sees it. What I just said is a statement about the program part

of those three activities, that a deputy chief deals with. You may recall that the other two were, first, budgets and second, personnel.

HKS: Let's turn to some conceptual questions. What were the top three scientific developments by Forest Service researchers when you were deputy chief? Things that you're really proud of; here's a turning point in scientific knowledge, or watershed studies, or however you might want to characterize that.

REB: There were a lot more than three to five important scientific developments, and most had their roots before I became deputy chief. However I'd like to think that scientists during my time set in motion research that is providing those same kinds of outputs today, ten and fifteen years later.

HKS: Sure. Truss Frame Housing

REB: Let me give you a half a dozen examples. Best Opening Face, that is the use of computers in sawmills, work by Hiram Hallack at the Forest Products Laboratory. Truss-frame housing, the use of engineered structural members around which you frame and sheath a house, work of Roger Toumey of the Forest Products Laboratory. That was another step in a long series of things that came under the Lab having to do with more efficient engineering of wood. Did you know that the amount of wood used in a house today is about half of what was used in a house at the time of World War II?

HKS: No, I didn't know that.

REB: Yes, just enormous economies in wood efficiency and it comes from a variety of sources. But one of the most important is improved engineering of wood, treating wood as an engineering material. Floor systems are cast differently than a pre-World War II house for example, and sheathing is entirely different.

HKS: I remember in forestry school we were taught that houses are way overbuilt structurally. That it's simpler to put the extra stud in than for the carpenter to figure it out. So what you're saying is that they have dealt with that issue?

REB: Yes, and it's a series of developments, one of which was truss-frame housing. Building a house in its entire cross section, instead of just the roof truss. Serendipitous things come out of findings like that. For example, in truss-frame housing, the work crew could go from a foundation to an enclosed ranch-style house in one work day. You would space these trusses on the foundation just like spacing slices of bread. Once the trusses were in place workers could take reconstituted wood or plywood panels and sheath the house before the workday ended. It's always interesting to see the serendipitous relationships that come out of things. Decay Organisms If we turn to the biological side, Kent Kirk came through with a much better understanding of the mechanism by which natural organisms cause wood to decay. He was working on the lignin part and a colleague in Sweden was working on the cellulose component in wood. They were the winners of the Wallenberg Prize for that achievement. You can see the importance of understanding how wood breaks down. The obvious possible application is biological pulping, or the breaking down of lignins into other useful organic compounds. You know it's still short of application, but it was a marvelous fundamental discovery. By the way, Ken Kirk was elected to the National Academy of Science on the basis of that research.

HKS: It has implication for landfill problems, biomass disposition, accelerating the rate of decomposition.

REB: Or the conversion of that material into other useful products. It's a fascinating area, and there's a tremendous effort going on around the world in that today. There were other major accomplishments in insect and disease research. One that I mentioned to you earlier occurred

right here in Corvallis. Roger Ryan's finding the parasite/predator complex that would control the introduced larch case bearer, solved that problem with very little fanfare. And there have been many others. Accumulation of Knowledge Permit me to focus on what I think has been the major contribution of Forest Service Research. It's not the spectacular and the highly visible technologies, as important as they are and as attractive as they are to the press and the media. It's the accumulation of knowledge that backstops major fields. If you look at the literature cited in a major monograph, on any of the important tree species in the U.S., on questions of seed and nursery practices, on insect complexes, on utilization practices, you'll see hundreds and hundreds of citations that came out of Forest Service Research. Small bits and pieces and increments of information. Some of the classical handbooks, reference sources, that you'll see on the libraries of forest practitioners anywhere in the U.S. or in the world came out of Forest Service Research. The *Woody Plant Seed Manual*, the two volume *Silvics Manual*, a manual on silviculture of the important forest types of the United States, insect and disease handbooks, wood engineering references, and on and on. This, in my estimation, is the major contribution, not spectacular, not flashy, but it's the accumulation of knowledge that backstops a whole discipline.

HKS: Sure, because it gives people something to build on in any direction.

REB: In my days of justifying research budgets, especially during times of cutback, that was the most difficult part of the budget, to defend and to justify, because it doesn't have those catchy handholds and immediate intuitive appeal. We searched for more attractive terms like continuing or foundation research which accounts for like 75 or 80 percent of the research of the Forest Service. This is the body of knowledge that permits a profession to deal with new or unanticipated problems. But it's difficult to maintain.

HKS: You used a term earlier that was new to me, upstream research. Is that basic research?

REB: It can be basic or it can be applied. It's the anticipation of the problems that are likely to come along. It is used frequently in international agricultural research to describe the basic or complex applied research needed to solve a problem--research that often is beyond the capacity of indigenous science. So when a Douglas-fir tussock moth outbreak comes along you reach into the literature and call on the experts, and within a short time you have skills and people address that program. You can apply that test to almost any field: fire, insects, disease, silviculture, ecology, hydrology, wood science and so on. An extremely difficult program to justify, not only in the Forest Service but in the Department of Agriculture as well. It's also the kind of research that invites pejorative adjectives like pedestrian, outmoded, outdated, and unresponsive.

HKS: I was surprised when I worked for the station here how much of the Forest Service manual comes out of research. People in the field don't know that and they probably would be upset, but the researcher has the technical information at hand to write procedures for fire danger rating and that sort of thing. So research really is pervasive in its influence. Non Forest Service Forestry Research

REB: One of the goals during my time as deputy chief was to straighten the non-Forest Service component of forestry research in the U.S. The McIntire-Stennis Act authorizes those expenditures to be up to 50 percent of those of the U.S. Forest Service research, with the implied understanding that the matching funds required in McIntire-Stennis would make the forestry schools equal in research effort to those of the Forest Service. At the time I went to Washington as deputy chief, I suppose the forestry schools research expenditures from all sources combined were approximately half those of the Forest Service. In the following years, the Forest Service Research budgets did not increase, but funding sources increased elsewhere. The Forest Service was an important contributor to university research, but the National Science Foundation, NASA, Department of Energy, and Department of Interior agencies all began to put money primarily into the forestry schools. I think today that earlier goal of approximate parity in research programs has been achieved, although not directly through McIntire-Stennis contributions as originally envisioned.

HKS: How about compatibility, cooperation with industry research, like Weyerhaeuser's research program and Westvaco's? Is there any link there other than a collegial link?

REB: Yes. It tends to be a volatile kind of cooperation in the sense that it ebbs and flows depending on the priorities of the two groups. The cooperation is far more effective on the land management side than it is on the products and the marketing side.

HKS: Because of proprietary interest.

REB: That's correct, and it's the research inside the plant gate where the industry can capture the benefits. I think it's obvious that the collaboration on the resource side is not nearly as easy to convert into a patentable or proprietary interest, and so there's a lot more collaboration. By the way the industry's support of land management research is really relatively modest. Weyerhaeuser and Westvaco are the biggest performers. That's the area where the public agencies, including the Forest Service, do the bulk of their work. The research inside the plant gate is primarily the industry side. When you count research and development including process improvement, new products, market development and things like that, the industry probably spends several times as much as the Forest Service and the forestry schools combined. Even on products-related research, I found a surprising sharing of information among industry scientists and counterpart researchers at the Forest Products Laboratory. Administrative Studies

HKS: When I was at the station I heard the term several times, in reference to National Forest Administration, administrative studies. That the regions actually carried out certain kinds of research of a very broad nature. I'm assuming that still goes on.

REB: Yes.

HKS: Why is that? Is it they want a faster turnaround time than the stations would..?

REB: Administrative studies are simultaneously a source of strength and a source of considerable tension. There's an intellectual curiosity on the parts of people who work in the National Forest System and in State and Private Forestry that should be encouraged. Administrative studies were intended to deal with site specific issues with questions of scale and operational procedures. It was the A part of an RD&A sequence. But it hadn't quite worked out that way. In most cases administrative studies have a terrible track record. Many of them are poorly planned, poorly executed, and almost never recorded for later reference. Keith Arnold and Ed Schulz, deputy chief for NFS, felt very strongly about that situation and worked out an agreement where administrative studies required approval of Research. As deputy chief, I didn't follow up aggressively on that point, because it was such a point of contention and friction. There are many examples, however, where Research and NFS have worked together to the advantage of both. One of the best examples in the country in the H. A. Andrews Experimental Forest here, where awards have been given by Research to the district people because of their work with the application side. The Chippewa National Forest was another innovating one. Research by States

HKS: How about the states, other than the state universities? The city and county of Los Angeles have done a lot of work, administrative studies, on fire, of I assume rather high quality. State nurseries would be an example too.

REB: Let me comment on research in the states. I tried to draw state foresters into research activities and participated in their annual meetings on a couple of occasions. I don't know what the follow-up has been since then. The story on the states in research is extremely uneven. It ranges from zero to fairly substantial. The states with research programs that come to mind are Georgia and Texas. When you add up all of the state forestry research activities, they probably amount to less than 5 percent of the total research expenditures in the country. The big performers in mainstream forestry are the Forest Service and the forestry schools. Today about

three hundred million dollars total expenditures for the two groups combined, maybe a little bit more. Industry's research is estimated to be about three hundred million dollars also, but that's mainly product development, process improvement, and so on, so the total enterprise is about six hundred million dollars. States are very uneven in what they do, but they are very willing cooperators. For example, we have experimental forests on state lands. Other Federal Agencies

HKS: How about other federal agencies? The National Park Service must do recreation research. BLM must do some range studies. Is there coordination?

REB: Yes. Yes, there is. It can be improved, but it's better than meets the eye. For example, here at Oregon State University the Fish and Wildlife Service and the National Park Service have cooperative research units in place. The Bureau of Land Management has just enlarged its program; they will have about five or six scientists here at the forestry school, and of course the Forest Service has thirty or so scientists here. So the collocation of several federal research groups leads to information sharing and collaboration. As George Jemison noted, Corvallis is a Center of Excellence for natural resource programs; I very much agree with him.

HKS: In general terms, are the quality of the scientists in the other agencies of the same caliber as the Forest Service? The Forest Service has been in the business a longer time.

REB: Today, essentially yes. There may be some minor differences in background and training, but it's not significant. The biggest difference among several of the agencies is the way they organize to do research. Forest Service Research is largely independent of the action programs, going back to 1915 when Earle Clapp became the first assistant chief for research. Much of the research of the three interior agencies comes under the action programs. In other words the National Park superintendent has overall control of the research of the park. The Bureau of Land Management administrator has control over research and so does the Fish and Wildlife service. The exception to these generalizations are the co-op units, such as those at OSU.

HKS: So continuity is always in question in the other agencies.

REB: Not so much a question of continuity, but that's important. It's the ability to ask the visionary and independent questions. Because when research programs come under close supervision by the action program, they tend to do day-to-day problem solving for the administrator and understandably so.

HKS: When you're testifying in Congress on the budget, do they ever say well we just gave some money to BLM, why don't you use their research?

REB: One always has to be prepared for those questions. In fact, I would have welcomed them. I was trying to build bridges to the Interior agencies, and I knew fairly well what their programs were. Now I need to make one point in fairness to the other agencies. I said that the bulk of their research comes under the close supervision of the line officer, such as the area director of BLM, the park superintendent, or the refuge supervisor. A part of each of those agencies' research now is done through cooperative units. That's a Department of the Interior exercise where small teams of scientists are located generally on university campuses to deal with long-range research questions. That's the mission of the co-op units here at OSU. Once again, a part of those research programs do have some independence, but the bulk of them are under very close surveillance of administrators of action programs.

HKS: BLM has had problems of managing or not wild horse herds and the damage or not they cause in competition with the wildlife and all this. I'm assuming some of their research is very specific, how to transplant wild horses or...

REB: I'm not sure that that program is backstopped by very much research.

HKS: It's one that gets a lot of media display. You can buy a feral horse or whatever they're called. The BLM has auctions and all of that.

REB: I don't know how much research is being done, not very much. The Intermountain Station had a small piece of that in the '80s. I don't know whether they continued it. Upstream Research

HKS: The next question I guess, to use your terminology, deals with upstream research. Overall, what's the track record of Forest Service Research anticipating the problem, so when the problem does appear, when it becomes publicly known, the Forest Service is ready with some kind of an answer?

REB: The track record, of course, is mixed. People who need solutions to problems, advice on problems right now, tend to be fairly uncharitable about our ability to anticipate those questions. I think we do better on it than meets the eye. I've already given you an example of the Douglas-fir tussock moth outbreak of the early '70s, and we had emerging research on a pheromone and a virus plus other entomological and ecological research that had accumulated since the previous outbreak. So we could mobilize that information fairly rapidly. Even with that vast accumulation of information on silviculture, insects and disease, fire and so forth, we still get caught off balance.

HKS: Let me ask you a specific question that maybe is not a good example but it's the one I was thinking about when I asked that question about upstream research. The red-cockaded woodpecker was listed as an endangered species in 1968 or 1969, and it's still a problem. Is it a problem biologically, or is it a problem in terms of management decisions? The problem hasn't been solved, it's still with us.

REB: We knew something about the red-cockaded woodpecker before its listing; I suspect more from ornithologists than foresters. Mike Lennartz, who was located at the Southeastern Forest Experiment Station at that time, took on the problem. Mike and his associates learned enough about the breeding and the feeding requirements of the red-cockaded woodpecker that they thought we could have timber and birds too. The breeding requirements required a small cluster of old growth pines that had decay in the center so that the birds could nest and breed. The foraging needs required far more area but were less restrictive; the birds could forage in managed timber. When I left Washington, I felt we had some workable solutions. But I suspect that what is involved here are value judgments and political issues where science really is of only marginal consequence.

HKS: About two months ago I got a call from a friend in Louisiana, suggesting that we do a study of the history of the woodpecker controversy, said it's really a hot issue. So I did a little bit of research on the history of the literature, and I was amazed how much was known, and how long it's been known.

REB: I think we need to ask ourselves the nature of the problem. Is it scientific and technical or is philosophical, depending on the value systems of individuals. The spotted owl out here is some of both. Oftentimes people call for research on essentially a political and value-driven problem as a way of prolonging the debate or avoiding a difficult political decision. We try to guard against that. I think some of that is involved in the spotted owl controversy.

HKS: It's a long story, but I'll just cut through to the punch line. I talked by phone to a guy named Jim Duke, a USDA scientist at Beltsville, who was getting close to retirement. He worked on taxol twenty years ago, and he, I think, could best be characterized as disgusted at the hoopla about taxol now, reinventing the wheel. All I can go by is what he said, the understanding of the chemistry of taxol was very sophisticated twenty years ago and was put back on the shelf. But there's upstream research. Whole-Tree Utilization

REB: But that happens to a lot of science, and I think we ought to view that as a legitimate part of the process. Let me give you an example from the Forest Service. In the early 1970s the pulp and

paper industry said that wood supplies are getting short and we want to look into whole-tree utilization. They said it would be far more efficient for us to chip the whole tree in the forest, put it into a van, take it into a mill, and then separate the bark from the chip. This process became known as the BCSS, Bark Chip Separation and Segregation. And John Erickson, now the director of the Forest Products Laboratory, was the project leader at Houghton, Michigan. The Forest Service had much encouragement from industry including support for budget increases from Congress. It was a problem intuitively appealing to the Forest Service as well. John Erickson and his team were successful in removing enough bark that the chips met the standards required by the pulp digesters. But in the meantime, the industry found that there were some unanticipated disadvantages to bark chip separation. For example there was enough grit and sand in the chips that caused excessive wear on the tubes and the pipes in the paper mill. There were a couple of very large trials, but so far as I know no mill today is using it exactly as developed by Erickson and his team, although portions are in use. It's a technology that for the most part is sitting on a shelf, and I'll wager that we'll be back to it. That's what happens with much technology or piece of technology. It sits there until it fits into something else. I'm not surprised about the taxol story. I recall reading that there was interest in taxol for other reasons a good long while ago, and that its advocacy for cancer was a later development which renewed the interest in taxol.

HKS: I guess it's a very complex molecule.

REB: That's right.

HKS: That's one of the difficulties, the side effects from the ingredient that dissolves it so you can inject it is part of the problem, isn't it? Taxol is not toxic, but the carrier of taxol...

REB: Could well be. I read in *Science* a short time ago that there's something like fifty or sixty or seventy laboratories trying to synthesize the organic molecule called taxol. This laboratory has a substantial budget for the ecology and the management of Pacific yew, in fact there are survey crews now inventorying Pacific yew in the Cascades.

HKS: We always thought that the only practical use of the Pacific yew was to make bows.

REB: Do I make myself clear? That one tries to target research so that the payoffs can be predicted but it's at best an imperfect...

HKS: RPA sort of forces an upstream thinking.

REB: Yes, it was intended to do that. But our vision is terribly imperfect. Then serendipity comes along. I mentioned the truss frame house. The reason that Roger Toumey was looking into new construction techniques for wood frame houses was to avoid the failures that were reported around the country from wind and earthquakes. He began to look at the failure points in a wood frame house. The failures occurred where the studs meet the floor and the roof. So he said to himself, if we make the union between the wall studs and the ceiling and the floor truss differently and stronger, we'll avoid those problems. He didn't anticipate a different construction technique for houses, but when we put the house together, imagine the roof truss like this [gestures] and the studs that anchored in there with nail plates, and yes you can take the wall studs and anchor them to a floor truss as well. Imagine that you have a cross section of a house in a single large truss. This solved the first problem but it also altered the construction techniques. You fabricate these trusses in a nearby fabricating plant, put them on a flatbed truck, move them out, and set them up one right after another like an erector set, then sheath the structure, and there's the house.

HKS: It has an impact on building codes.

REB: Actually the adoption of truss frame has been fairly slow. But we can be sure that it or variations of it will evolve into construction practices. Let me give you another example of

serendipity. The pulp and paper industry, which is far more advanced in forestry research than the solid wood products or the wood preservation group, suggested to the Forest Products Laboratory that they do research on the bonding mechanisms of wood fibers. Very basic upstream research. Vance Setterholm of FPL took on that job, and he began to form sheets under heat and pressure and under constraint to keep the fibers from squirming. The sample papers were much stronger. Then he began to do that with pulp furnishes from short-fibered red oak and other hardwoods. He was finding paper strengths that exceeded those of long-fibered softwoods. That process came to be called pressdry. Vance didn't set out to do that; he wanted to understand the bonding mechanism, but one of the incidental byproducts was that if we form a paper mat differently than we had, it will permit use of tree species not utilized before, and in some respects, achieve superior products. Now the industry has not adopted in any significant way pressdrying, but they've moved toward it. Pulp and paper mills all over the world, I am told, are using a process called extended nip. You know paper is squeezed rolls. But if one can extend the contact that occurs at that time, more densification of paper results and higher strength properties occur. This is called extended nip. In many respects, that's an example of how research manifests itself. Our ability to predict where it will take us is at best imperfect, but we went from basic research to fiber bonding, to a new way of forming paper, to a modified system in pulp and paper mills that takes advantage of some of those processes. Oriented Strand Board

HKS: Last fall in south Georgia I toured for the first time an OSB plant. I understand there's a German patent, all the equipment comes from Germany...

REB: Could well be.

HKS: The impact on land management has to be extraordinary.

REB: Enormous.

HKS: There's a market for hardwood, hardwood not of furniture grade. Hardwoods have been a problem, and now suddenly they're out looking for hardwood.

REB: Technology has to be a major strategy in the management of forests. Let me make another comment on reconstituted wood, structural flakeboard. As I understand it, the genesis of that work came out of Canada, and I think it may have been an industrial researcher who worked on this concept. It was picked up, particularly at Washington State University by George Marra who later became deputy director of FPL. George did a lot of work with reconstituted wood and the Forest Products Laboratory also did some of the modifying and the adaptive work on structural flakeboard. So here was a technology that had its roots and its reinforcement in several different places. Structural flakeboard today is a major growth component of several forest products firms. Even here in the plywood region of the West, we're seeing structural flakeboard. Now the next generation of research had to do with operating the strands, this is called oriented strand board. Actually I don't know where the seminal technology occurred. I suspect that some of it came from British Columbia because the Wallenberg Prize was given there for developing the concept of oriented strand structural board. Oriented strand board is in contrast to the flake board, where the flakes are not oriented. The orientation gives greater strength properties. But that was a predictable next generation in the way that we go. What have the consequences been? The plywood industry is in serious decline because an alternative was found. On the other hand, the big trees that formerly went into plywood now can go into lumber.

HKS: Earlier we talked about the legitimacy of a Forest Products Lab, with the federal government being engaged in products development. A related question in my mind is, in Canada there's FERIC, the Forest Engineering Research Institute of Canada.

REB: Right.

HKS: Which is a federal/private enterprise. Why isn't there something analogous in the U.S.? It seems such a logical thing when you watch what it's doing in Canada. We've already accepted the philosophy, having a Forest Products Lab. Were there ever suggestions that we get into equipment analysis and testing and development?

REB: There really are two questions here. Let me take the second one first. The FPL does do product analysis testing and development, especially where a strong public interest can be demonstrated. For example, FPL had major leads in developing new lumber standards, in evaluating wood preservatives for efficacy and safety, and in developing fire safety standards for wood houses. The Lab often is uncomfortable with these tasks, feeling that industry or other agencies should do the repetitive work. The second question has to do with prioritizations of part of the research. I was never comfortable with the Canadian approach to FERIC (equipment engineering) or FORINTEK (forest products research), or for that matter similar efforts in New Zealand or Australia. For example, in Canada the public was expected to provide part of the funding and the private side the other. I suspect that the public funding was fairly stable and the industry contributions volatile. Furthermore, the industry contributions have a way of strongly levering the public funds to the advantage of the industry. There have been new developments in the U.S. since my retirement to accomplish some of the same ends--new legislation to deal with cooperation and patent procedures that observe the proprietary nature of some research. Questions about these new approaches should best be directed to FPL. I have the impression that there are better alternatives for the U.S. than privatizing of public research laboratories.

HKS: I was thinking of development costs. Feller-buncher technology is so important to the South. They're expensive gadgets, and the small landowner or the modest size landowner can't buy one to test it out. It's the practical part, and FERIC seemed to be such a logical solution. I would suppose some American enterprises, John Deere and Caterpillar, didn't want the government ranking them, sort of a *Consumer Reports*.

REB: The Forest Service is sensitive to that applications side for their own internal use. They have two equipment development centers, one in San Dimas and one in Missoula. The equipment development centers were intended to test and modify equipment that would be useful to the Forest Service, mainly fire fighting and transport equipment, nursery and tree planting machines, safety equipment, and so forth. My impression, however, is that much equipment development has been fairly well addressed by the private sector, especially in North America, in central Europe, and in the Nordic countries. International Networks I want to comment about international networks. One of the great advantages, as I see it, in IUFRO and other international networking associations is the sharing of technologies. For example, Europe is ahead of the U.S. in matters related to worker health and safety. Much of the technology developed there is now used by U.S. workers--safer chain saws, protective clothing to prevent injury, and reduction of noise and equipment vibrations. I think we owe credit to Europe, and especially the Scandinavian countries, for some of the developments that led to things like the feller-buncher and the various kinds of forwarders. That occurred after World War II. The reason for this was because of their labor shortage and rapidly rising labor costs. This led to research and development programs in Scandinavia to substitute machines for labor. The U.S. and Canada also took part, but major contributions came from Europe. IUFRO has a very active work group on forest engineering that collaborates, especially with Europe but with other countries as well on various harvesting and transport systems. So some of that technology that you were seeing in the South, I'll bet had its origins in parts of Europe.

HKS: A guy in industry was explaining to me that workman's compensation insurance has just about eliminated chain saw work. The cost per hour for operating a chain saw is greater than the cost per hour of operating a feller-buncher because of workman's compensation liability. OSHA regulations, everyone has the ear plugs on now if they're around noisy equipment and all the rest of that.

REB: Yes, but much of that technology came out of Europe. Chaps to prevent chain saw injuries to legs, I think that came out of Europe. Some of these hard hats with the ear muffs.

HKS: Right.

REB: In the case of Scandinavia, and the U.S., we're oftentimes substituting capital for what at one time was labor, you know hand felling and so forth. This ability to anticipate, to substitute among the various factors of production, is very important in the private sector, and should be in the public sector as well. In fact, one of the things that should guide a research program is how to combine these production factors--land, various forms of capital and labor--more effectively. Industrial Research I'm going to make another observation. The Forest Products Laboratory has had an annual meeting with industry groups for more years than I was in Washington. As I mentioned earlier I used to join those meetings. It was interesting to observe how industry and the Lab interacted. There are all kinds of subtle and subliminal signals that flow back and forth in those meetings. Three groups participated; one from wood preservation; the second from the solid wood industries, that's plywood and sawmilling; and the third was from pulp and paper industries. You could see in those discussions various degrees of sophistication and awareness of science. Pulp and paper was far more advanced scientifically than either of the other two. And the pulp and paper industry would ask the Forest Service to put emphasis on the basic or the upstream research, and they would do the adaptive work. The solid wood products groups were mixed. I remember a Weyerhaeuser representative saying essentially the same thing as pulp and paper, you do the basic studies and we'll do the adaptive research. But the solid wood products companies that were less well backstopped by research would ask the Forest Service to do the more adaptive and the more applied research. The wood preservation groups had essentially no research program of their own. They kept encouraging the Forest Service not only to work with various preservative questions including new chemicals, toxicity, and things like that, but actually to evaluate and field test the treated wood--from more basic research all the way to application. The question often arose in my mind about the proprietary research the industry was doing, what that meant for a publicly supported research program? Lab scientists often could tell what the industry was working on by what they told them directly and what they discouraged them from working on. Still another source of information came from the keen interpersonal relationships among industry and FPL researchers. There would be private discussions with pledges of confidence which were invariably observed. But the industry had a way of sending those subtle signals about what they thought was important and what they thought you shouldn't be working on.

HKS: I was talking by phone to people at TAPPI in Atlanta, they're sort of the bibliographer for the industry. They don't know what the industry is doing. They said by the time we find out and include the research in our database, it's already been patented and sometimes even obsolete.

REB: The temptation is always to suggest an inventory of what we're doing and that will identify the voids and the gaps. However, this simply is an unworkable way to go with industry. They simply won't respond, and it's understandable why they won't. I always discouraged that approach when we worked with industry because it lacked realism. The thing that does work are these informal exchanges where information flows back and forth in a variety of ways.

HKS: A dramatic advance in technology, maybe dramatic is not the right word because it took place over a twenty-year period, this paper mill is right on the highway out here, just north of here on the outskirts of Albany.

REB: Willamette Industries.

HKS: Twenty years ago you'd be on I-5, you'd have this tremendous volume of crud coming out of the top. I drove by the other day and I couldn't see anything.

REB: Oh, I think the air quality standards have really been improved. It was a fascinating mill. I came down I-5 a number of year ago with Dave Mason. Dave was on the station advisory committee, meeting in Corvallis. He was in his eighties if not early nineties. He told me a story about that Willamette mill. It was built in the 1950s under the guidance of Ira Keller. Keller said he could build a mill for eight million dollars and it would use wood residues not round wood material. You may remember twenty years ago that building didn't have exterior walls; it was just a steel skeleton with a big digester. Dave said that that mill came in on budget and it set in motion the growth of the pulp and paper industry here for the next thirty or forty years. The pulp and paper industry here has grown on wood residues, not round wood--wood that formerly went into wigwam burners and hog fuel.

HKS: I imagine it wasn't on the main highway then.

REB: No.

HKS: Not a very good public relations thing to build it right on the interstate, but the highway came later.

REB: At least they've enclosed the mill; it's just not a bare, iron skeleton. Anyway a fascinating story, the Willamette mill. Missionary Work in Research

HKS: One of the questions that your colleagues wanted me to ask you was a little bit surprising. Is there need for missionary work to advance research within the general field of forestry? I could see that fifty years ago and thirty years ago; is it still an issue?

REB: Yes.

HKS: Is it because the general practitioner just doesn't think research is necessary or..?

REB: I don't think it's different whether it's research or anything else, you simply have to champion your product. You have to give it visibility, demonstrate its worth and its quality. That's what I was trying to do when I waved a 2 x 4 in front of Bob Bergland. Some people are far more effective at it than others. Some of the big names in science, Carl Sagan, Paul Erhlich, others, have the ability to articulate a science program. It surely has to be one of the important considerations in recruiting a leader of a research program.

HKS: The *Journal of Forestry*, over the years, has received a lot of criticism from the run-of-the-mill forester in the field because there's nothing useful in it. I have no idea what percentage of foresters feel that way, but you've heard the criticisms.

REB: Yes.

HKS: SAF is always fiddling with the journal to make it more appealing to the guy on the ground.

REB: And the audience is so diverse that they can't satisfy very many. For science and technology they've come up with *Forest Science*, which was a Steve Spurr contribution of forty years ago, and now three volumes of applied forestry.

HKS: Regional.

REB: Regional journals, and so the technical content of the *Journal of Forestry* has gone way down. Economics Research

REB: There was a cyclical quality to that issue. I was looking at the annual report of the Pacific Northwest Station during my first year as director. Timber supply was the big issue in the 1970s, and we featured it in the annual report. The incremental changes in our research program were

tilting in that direction with Project FALCON, another program involving close timber utilization and so forth, which was then in response to an economic issue tempered by emerging environmental questions. Later in my time here the emphasis shifted very strongly to environmental concerns, and the research moved in that direction. I used to think that if you watched a research program for ten years, you'd come right back to where you'd been earlier. I think that that's normal and reasonable. You never drop everything you're doing and go on to the next fad, it's always an incremental change with a strong cyclical quality. What Would I Do Differently More Research Decentralization

HKS: What would you have done differently? You know now the things that worked and the things that didn't work.

REB: You know I've reflected on that question in the seven years that I've been away from Washington, D.C. One of the things that I would consider is further decentralization and slimming down of the administrative structure of the Research branch. Some of that slimming down was occurring during the Crowell days as budget declined. I was determined that we were going to make as many reductions on the administrative side as we were required to make on the science side. The work was still there, but the remaining people would be forced to triage their time. Often I was surprised at how little loss occurs with neglect or abandonment of lower priority jobs. Also I would be looking to push to lower levels decisions affecting science. Fewer assistant directors at the station level; the place that I would place more accountability and responsibility is at the project leader level. And I would say to the project leader, you have now more authority to make decisions, to do things right and to do them wrong. Those are risks we're prepared to take, but you do it. It takes a mature organization to do things like that, which the Forest Service was with its limited recruiting and declining budgets of the 1980s. I would also increase accountability. I would say to the scientists, you've more authority to make decisions, to plan your programs, and to allocate budgets, but you also have to be accountable for what you're doing. That means I would tighten up the Person-in-Job procedures. Decentralize, but enhance accountability.

HKS: Where we're sitting right now as a case study, is there more administrative structure in the forestry school than there is in the Research branch? You've got a dean, you've got one or two assistant deans of some kind, and a director of graduate studies and several department heads.

REB: The administrative structure of a forestry school is different because of the nature of the workload. Student advising and teaching, both at the undergraduate and graduate levels, drives that work. I don't think it's fruitful to compare the administrative overhead in the two organizations. I have the impression that both organizations work equally hard with about equal efficiency, but the administrative workload is different. Both organizations need periodic review and belt-tightening.

HKS: It seems to me that in university research, professors don't need the dean's permission in the review process, they are more autonomous. There's less concern about community, about dissemination of the research. This is the perception that I have and it's not based upon anything other than very casual observation.

REB: Oregon State is not typical of forestry schools, but it's a highly regarded one. Carl Stoltenberg was and George Brown is providing strong leadership to the departments. But university professors are not nearly as autonomous as you might think. Part of the rigor and the discipline that goes into a university appointment are the demands of the classroom and students. A university tends to be organized around teaching programs and that in turn strongly influences research programs. Universities, and Oregon State is one of the few exceptions, tend not to do much team research. If they do, they often create quasi-independent institutes to do it. One more observation. People both in the Forest Service and the forestry schools, especially those who do not have close personal and professional working relationships with the others, tend to characterize the other by stereotypes and clichés--generally unfavorable and unfair ones at that. A pity!

HKS: Right.

REB: One gets the impression that university professors come and go as they see fit, and in some respects they do, except when they have to meet requirements such as teaching, committee assignments, and student advising. Their schedules often are more rigorous and demanding than those of a Forest Service scientists, especially when a quarter or semester approaches an end.

HKS: Observing at Duke, five years ago they had a professor in what's now the School of Environment that was interested in Canada. He left, Canada dropped off the radar screen. That's how you were worried about the pioneer research, your concern that the continuity ends when that superstar retires and there's nothing to carry that on.

REB: I'm not sure I fully understand the question.

HKS: I'm trying to compare university research to Forest Service research in terms of continuity, that the university professor has more autonomy to pick and choose the subject. They have to do good jobs on what they choose, but there's no research plan for the school, no agenda, no RPA-driven concepts.

REB: The university research program is more sensitive to a broadly-based teaching program and to external forces than is the Forest Service. I don't know whether that's evident or not.

HKS: Grantsmanship.

REB: And that's part of the reason. Most university research funding comes from external sources. Oregon State University has one of the largest state supported research budgets in the country. I think it's about $2.5 million per year, and the other six or seven million dollars in their annual budget comes from external sources. External sources can strongly influence the direction that research takes. It's amazing how responsive university professors will be to external sources. But we need to keep in mind that recruitment to a faculty is more often driven by teaching needs.

HKS: The University of Washington when I was a grad student, a lot of Atomic Energy Commission money was available for soil study because of the bombing in the atolls in the Pacific. I think half of the graduate students there were working on Atomic Energy Commission fellowships.

REB: Sure. It was enormous opportunism. The university professors require freedom, but they can be tugged around by money sources, actually more readily than the Forest Service. A point that you're making though is one that I would build into what I said previously--decentralize and slim down. Where greater discretion and greater freedom can be given, people will react with responsibility. There will always be exceptions and this is one of the problems with public employees, especially federal employees. We tend to gear our administrative procedures to our losers, not our winners.

HKS: This leads into what is my final question--your new career. Your vision of academic research must have shifted a bit since you've been in residence in this fine university. That's sort of what I was leading to with the previous question.

REB: Would you please permit me to stay with the previous question for a minute. You asked me what I would do differently, and the first thing I said was that I would decentralize, I would put more responsibility farther down in the organization, greater freedom to make mistakes but also greater freedom to be innovative. The second thing that I would do, and I would argue this with the chief and his deputies, that the Forest Service would be better served if there were greater autonomy among the various program areas. It's almost like the profit centers in an industrial

group. I would argue that the programs of the Forest Service are major sources of strength in their own right, and I would seek greater visibility and some independence of action for the three, now the four program areas, including International Forestry. But I would also insist to the point of indignation that there be greater mutual support among the four programs of the agency. Greater respect for each other's mission and greater support for the work of the others.

HKS: I experienced that when I was doing research on the history of the Forest Service. Bitterness might be too harsh a term, but it's close to correct for some of the retirees, who felt that timber management and fire were the glory guys all during their long, forty-two year careers. They always were dealt the nickels and dimes, timber management got the millions, and I guess that's human nature.

REB: You probably can't dismiss the problem by fiat. But do you see the philosophical point that I would make? For example, Max Peterson and his predecessors insisted that they were the line officers directly responsible for nine station directors, including Forest Products Laboratory, eight regions, two areas of State and Private Forestry. When you add WO staff reporting directly to the chief, he is responsible for the performance of nearly thirty people. And he can't do it.

HKS: That's too many.

REB: The chief goes through the motion of trying to monitor the performance of nearly thirty people. It makes him a mechanic. It takes time away from the longer range visionary things plus external contacts that only he can do. I would argue that the deputy chiefs ought to deal with the performance not only of their Washington office staff but also for their line officers in the field, subject to audit and review by the chief and the associate chief. The deputies would be held accountable for the performance of their line officers in the field; they in turn would be responsible directly to the chief. Of course, field line officers would continue to have direct access to the chief and associate chief. But there is more to the change than who reports to whom. I think this would allow for more innovative thinking not only in the chief's office but also in each of the major program fields. New Perceptions--New Research?

HKS: Somebody told me recently that the Washington office is an anachronism, and since New Perspectives, it's the last outpost in the Forest Service of functional thinking. The question I'm asking, it must have an impact eventually on research. If we now truly have interdisciplinary management, the kinds of questions that are coming out of the field are going to be different.

REB: I can approach that question either as a cynic or an advocate, depending on the time of day. In a positive vein, I made the point several times in this interview that a new leader has to reassess the environment and, when appropriate, put a new face on things. Sometimes the new face really is a reaffirmation of existing practices or only slight modifications. I see some of that in New Perspectives, New Forestry, and now Ecosystem Management. It's putting a new face on some things that have been around for a long time. To be sure today, especially on federal lands, we need better integration of resources. That's the positive response. The negative response is that it's a gimmick. It's a way of trying to quiet criticism, and not very much is likely to come out of it. The next time we have a change in leadership we'll have a new gimmick.

HKS: I was thinking back to your statement that one of the most significant contributions of research is a solid body of basic grunt work literature. Definitive, authoritative, evaluative, on very arcane slices of knowledge. Bibliography of Frasier fir silviculture or some such thing, the building blocks. New Perspectives says well that's not the kind of building blocks we want any more. Or does it?

REB: The basic building blocks would be required no matter what direction management practices go. The place where that body of knowledge is lacking is in some of the newer fields of science: recreation research, social forestry, wildlife and fish habitat, hydrology, and ecology. These are newer entries into the field and a body of knowledge is far less developed for them

than it is for the older ones. Another point. Research aimed at integration is far more costly than unidisciplinary research.

HKS: And in a sense it might be more ephemeral.

REB: It will certainly be ephemeral if it doesn't observe some fairly basic principles of experimentation and experimental design. Too much of the ecological research in the West is observational and deductive, not experimental and inductive.

HKS: It's harder to generalize in integrated research.

REB: By the way, that's one of the major shortcomings of this thing called administrative studies. They just don't have a memory. One of Arnold's and Dickerman's major contributions were to give a lot of support and emphasis to integrated study, like the 3-Bug program, SEAM, CANUSA, and FALCON. That was a significant contribution. I really wanted to make those two points. Decentralize and a respect for more autonomy among the various program areas, and I think that would serve the Forest Service very well.

HKS: Who would have been the resistor to this proposal? If you had come to chief of staff meetings and said, "I want to decentralize research even more than it is," who would have said, "Wait a minute"?

REB: I don't know, I think that's a question you ought to ask others. I have the impression that this is not an agency requirement; it is more the proclivities of individuals. It's true that there's some agency chauvinism built into that issue. We're the Forest Service, the premier federal conservation agency. I think we can still be a premier federal agency with an enviable mission. Do you know of any other agencies in government that have a more comprehensive mission than the Forest Service?

HKS: No, in sense of identity or of esprit de corps. I suppose the FBI at times since past has been, the agents have been very proud employees.

REB: Agency élan was there for the FBI, but law enforcement is shared by several federal agencies.

HKS: One of the criticisms I've heard of Research, hell those guys don't even have the uniform. You've got to belong.

REB: To many within and outside the agency, the national forests are the Forest Service--all other activities are in support of this program. The Forest Service has a strong legislative mandate to manage one hundred ninety million acres of land, to cooperate with state and private forestry, to conduct a research program, and to participate in international forestry. What other agency of government has as comprehensive a mission as that? Unfortunately, in the minds of many, that mission focuses largely on the national forests. If one thinks about it, the contributions to American forestry from Research and from a strong S&PF program could exceed those of the national forests.

HKS: Most agencies don't have land to administer.

REB: I don't know of any forestry agency in the world that has a more comprehensive mission than the Forest Service, and a legislative foundation to support it.

HKS: When you look at the Forest Service philosophy, the existence of the agency or not, it is, as McGuire once called it, a grand experiment. The Forest Service is inconsistent with the general sweep of American history, with having the federal government having a hands-on role in day-to-day operations out in the field. Owning the land and managing it. We don't have federal farms.

REB: No.

HKS: But we have federal forests.

REB: But that large and comprehensive role, not only for national forests but also for other programs, is a source of vulnerability. Perhaps with the benefit of hindsight, my desire to enlarge the participation in science programs was a way to recognize a monolithic organization with a dominance in the field, as a source of vulnerability, but also a loss of access to other sources of innovation. Along these lines, as I've said before, I would encourage more senior exchanges between the Forest Service and its external cooperators--but with one important caution. It is important that the best people possible be chosen for these assignments, not second choices. And when the Forest Service sends its people to other agencies and departments for short term assignments, they too must be first choices.

HKS: Is part of it the complexity of comparable health plans and retirement benefits?

REB: Yes. We underestimate the importance of the fringe benefits. Forest Service research was simply not competitive in the early post-World War II period with universities. Consequently, some of the best and the brightest of the Forest Service people left. They became the major professors and the deans of the forestry schools. The most important reason was economic. Universities were paying more. You remember those days.

HKS: Sure.

REB: Then Eisenhower came in, a Republican who said that there ought to be equal pay for equal work. That brought the comparability issue into the federal government, and in a short time, the Forest Service became fully competitive, and in fact as university salaries increased more slowly in the '70s and the '80s, the Forest Service became more than competitive. Better salaries plus Person-in-Job meant we could pull people away from universities, industry, and other organizations. So we often underestimate the economic and the fringe benefits, including retirement benefits. Until recent years, Forest Service people were captives of the retirement system; they simply couldn't afford to leave.

HKS: Yes, I understand that.

REB: Now that's been liberalized and made more flexible under the Carter administration with the Civil Service Reform Act which liberalized retirement options so that one could leave and come back.

HKS: If it fits I'm going to ask Keith Arnold about that, because there's someone who has popped in and out from universities to Forest Service and back a couple of times.

REB: Keith did all of that when the retirement system was not so generous, so he did it at some personal cost. Maybe that's why he's still working. [laughter] Does that answer your question? Economic and fringe benefits are rarely talked about, but they're important.

HKS: Our expectations as individuals have changed a great deal in the past generation in terms of retirement benefits. Health care is something else, you can't get two people together for an evening without health care costs coming up like it did for us last night. You have to address the issue. Post-Retirement

REB: This relates, I think, to the next set of questions. Let me just comment about my retirement. I moved into the deputy chief's job at a fairly young age, I was forty-eight. My tenure could have been as long or longer than Harper's and still retired at that informal retirement age of sixty-two that the Forest Service observes for its senior people. It wouldn't have been as long as Clapp's,

which went about twenty years. But I didn't want to stay that long. The signals about when you ought to retire are really terribly imperfect. I was unsure about how much more I could contribute. It was time for me to retire and to give someone else the opportunity to do the job. And so in January 1986, I retired after ten years in the job. The exact timing of my retirement was also strongly conditioned by relaxation three years earlier of an onerous and punitive pay cap on senior federal employees. Federal retirement is based on one's highest three-year salary, and I couldn't afford to forego the additional retirement benefits.

HKS: Let's be sure to talk a little bit about the selection of your successor, to the extent that you understand the mechanism and are willing to discuss it. You're not quite sure how you got to be deputy chief, the mechanism, because no one talked to you about it, you weren't interviewed for the job. Is this normal?

REB: I didn't have a keen appreciation of the process at that time; I do now--although I'm not sure we keep prospective candidates any better informed. During my years as deputy chief, I tried to maintain informal rosters of potential candidates for all senior positions in Forest Service Research. It was a useful device for me to discuss successional questions with station and staff directors as well. While the position of deputy and associate deputy were not on the rosters, they were very much on my mind and came up frequently in executive discussions of chief and staff. I don't remember all possibilities but there were four names I would discuss with Max and other deputies at our executive sessions. One of them was Ross Whaley who had come back to the Forest Service in the late '70s and left five years later to become president of the School of Forestry and Environmental Sciences at Syracuse. Another one was Dave Thorud who had been in the Forest Service for six or seven years and is now dean of the College of Forestry at the University of Washington. Internally there were two candidates. One of them was John Ohman who was deputy chief for State and Private Forestry, who had been director of the North Carolina station, and wanted to come back to research. And the fourth was J. B. Hillman. J. B. had been the director of the Southeastern Station, came in as associate deputy chief with me about 1976, lasted in that job about two weeks when, I think it was McGuire said we needed him more in the National Forest Systems. So J. B. became associate deputy chief for NFS and stayed in that job for several years. He was highly regarded by the National Forest System. So those were the most plausible candidates, two from the outside and two from the inside, that I was talking with Max about. There were others who could have handled the job but because of family reasons, newness in their current job, or anticipated retirement did not figure strongly in the selection. John Ohman had been deputy chief for State and Private Forestry for several years, and I had the feeling that he was getting weary. That S&PF job is one of the most trying of any of the deputy chief activities. John really wanted to come back to research as my successor. However I thought that J. B. Hillman, of the internal candidates, was the first choice to head Research. He was an outstanding director of the Southeastern Station, and as associate deputy chief in NFS worked very well. But he was eligible for retirement in a few months of the time that I was eligible. He adopted a different agenda. He wanted to go back to his rural roots in western Virginia, and he just didn't want to be a candidate. I was keenly disappointed. In any event, John Ohman became the next deputy chief for Research.

HKS: You have this list in front of you of people of significant accomplishment by any measure, yet four or five of them stood out. Can you articulate what caught your eye? What did you look for?

REB: It is a complex calculus that came from consultations among people who were supervisors of potential leaders. It came from my own personal impressions and observations including how well does this person handle himself in public; how well does he articulate his ideas; what is his vision of the future; and how quick are his thought processes, among others.

HKS: Physical stamina strikes me as significant. You guys travel an incomprehensible amount compared to us civilians, and that's hard work.

REB: I said that this was a calculus, it was a complex integration of a whole set of factors, and you also have to add family considerations. Are there teenagers in high school, how well will they take a move, can we postpone a move or should we advance it? What is the next move beyond this one? If we bring a person into a staff position, what is their potential beyond that? And I've mentioned several times the complication that the two-track, Person-in-Job career ladder proved for Research. But, like all such forecasting, there's an error term. I used to seek all the information I could, I'd layer my own judgment but occasionally you make mistakes. Occasionally means mistakes no more than half the time. [laughter]

HKS: McGuire said one of the most important jobs the chief has is to provide for succession. You've got to keep the people coming at all levels of the agency.

REB: That's right.

HKS: Who's going to be the next regional forester, who's going to be the next forest supervisor, you've got to make sure this happens, otherwise everyone retires and there's nobody waiting that's ready to go.

REB: That's right. You remember the three big jobs of the deputy--budgets, programs, and personnel. Now I've given you some details about the succession to my job. John Ohman was deputy chief for Research for three years and retired for a number of reasons. Jerry Sesco became the present deputy chief for Research. Jerry worked under me as budget coordinator for several years and did very well. He went to the Southeastern Station as assistant director, later becoming director of the station. He stayed in that job a relatively short time and moved to the WO as associate deputy chief for Research, one of the two associates under the deputy chief for Research, then John Ohman. When Ohman retired, Jerry became deputy chief.

HKS: Sure.

REB: That's how I dealt with questions of succession. I've omitted many of the details of internal discussions, but you can probably guess the nature of them.

HKS: Does the chief make a recommendation to the secretary?

REB: Yes.

HKS: The secretaries pretty much rubber stamp these recommendations? I mean, can you count on it?

REB: More so at senior levels below the chief/associate chief. That's why every chief that I know, especially Max and John McGuire, spend a great deal of time thinking about their succession and the timing of succession. I'll wager that was a major part of your discussion, a significant part with both Max and John.

HKS: In your case, where you postpone your retirement, postpone is not quite the right word, but you had an incentive to stay on a few more years. This succession calculus is changing daily.

HKS: Yes, that's correct.

HKS: Because if you'd retired this year rather than that year, there'd be somebody else in the wings.

REB: Right! Politically the succession for the chief's job is an order of magnitude more sensitive and more complex than it is for any of the subordinate positions. Sometimes the associate deputy chief can be sensitive, and sometimes one or more of the internal positions can be sensitive.

HKS: I suspect that not all personnel matters you dealt with are rewarding.

REB: It's fun to deal with positive personnel things, but all of us in those jobs have to deal with adverse ones as well.

HKS: Absolutely.

REB: The adverse personnel activities never get the publicity, nor should they, but they were among the most painful and time consuming jobs that I had to deal with.

HKS: Yeah.

REB: Downgrading a senior scientist for nonperformance, personal indiscretions, fiscal malfeasance, and dealing with different personalities. All of us I think have etched in our minds vividly those many encounters.

HKS: It's tough, and the list of grievances gets longer with all the affirmative action...

REB: The legal foundation for adverse action really has tilted the benefit of the doubt to the employee. That's probably the way it ought to be. The thing that always used to trouble me were those who finessed those things, to move a substandard performer into a different job, generally horizontally, sometimes vertically, in order to get a nonperformer into a different position. I did so on two or three occasions, but never felt good about it. I would do those things differently today. For those three staff positions in the deputy chief's office, I always tried to choose people who had a clear capacity to move up, but occasionally things were so unsatisfactory elsewhere in the Washington office that I would occupy one of those positions with a marginal performer intending to move them out at an early opportunity. It was a mistake. Marginal performers don't become better performers with a changing job. But sometimes the situation in the antecedent position was so unsatisfactory that you just had to do something.

HKS: It might have been just that chemistry, get them with a different mix of personalities elsewhere.

REB: The courageous thing to do is just simply to confront the issue directly. It's a performance question, what are we going to do about it and how. One of the things that a senior administrator cannot do is deal with all of your personnel problems at one time. You tend to address them incrementally and sequentially. Where are they; what do I need to address first? What's second? What's third? As soon as you resolve the first three problems, you expose still others.

HKS: Sure.

REB: It requires enormous energy to deal with the adverse side of things, and you just don't have enough of it to do all of the things at one time.

HKS: It's a matter of priorities, you deal with the worse first. Are we at a good time to move into your new career? New Career

REB: Yes. This is going to be short.

HKS: All throughout your time in the Forest Service you were working cooperatively with the universities. Now that you've had quite a few years of hands-on experience as a university professor, have your perceptions changed? Would you have done things differently in your relationships with the universities if you had known just a little bit more what you understand now, having been here on campus for so long?

REB: I really don't think so. Maybe minor and marginal changes, but I really don't think so. I personally view my working relationships with the university system positively, and one of the most satisfying. I knew Oregon State University from my days as director of Pacific Northwest Station. I knew it through the eyes of George Jemison, who joined this faculty when he retired. I knew Carl Stoltenberg for a whole lifetime. I knew George Brown, now the dean, who earlier joined us for a year in Washington. So I knew a lot about OSU. But I knew a fair amount about the other sixty or so forestry schools. So, I don't think I would have done things very much differently, except to reinforce what we were already doing. More collaboration, more cooperation, more confidence in what each other was doing. The thing that I have come to appreciate more here though were the day-to-day operations of a university, not the longer term strategic view but the daily operation. It's different. In earlier days I might have wondered why professors are sometimes so relaxed and casual; today the follow-up question would be, how far along is the quarter or the semester? How many undergraduate and graduate students are you advising? How many committees do you serve on?

HKS: Yes.

REB: University professors can work day and night as a quarter or a semester approaches an end, mainly because of the teaching burden. They have to relax between semesters, and I am far more charitable about that. I think the most satisfactory aspect of university life, and other professors tell me the same thing, is working with students. I've had several graduate students, all of them with foreign experience, but I also serve on a number of graduate committees. Most of my students are upperclassmen or graduate students. I may see a slightly more mature group. It's fascinating to learn about where they come from, their hopes, their aspirations, to assess their potential, to encourage their development, that's been the most rewarding part of the job.

HKS: Do you have formal classroom responsibilities?

REB: I teach, yes, but it's diminishing. I was responsible for the Starker lectures for the first four years here, and I still teach two seminars on international forestry, and I'm a guest lecturer in dozens of classes.

HKS: What textbook do you use on international forestry?

REB: I don't use textbooks. I use my own material.

HKS: Jan Laarman and Roger Sedjo have a book out.

REB: I want to read the book. Their textbook would be more for undergraduates. I use a lot of my own visual material in teaching and a series of references, contemporary references about issues. There are some personal satisfactions that come with being here, a good forestry school and reasonably well supported. But equally important is that this is where our family is. Our two sons and two daughters are graduated from Oregon State University. Three of them have two degrees from this institution. There are grandchildren here, very close at hand, they're all in Oregon. So there were some very personal reasons for coming.

HKS: I'm impressed by the vision or the finesse of Carl Stoltenberg. I'm impressed that Jemison and you are here. It strikes me that having you two guys at the bat is a real coup. Both of you guys added a cosmopolitan element that's missing in a lot of forestry schools. I would wonder if other deans are a little bit jealous of Oregon State for having you guys around, if there'd be a perception that a lot of federal money must come this way because you're here.

REB: That part of it didn't turn out to be true. I suspect that your assessment is correct. Carl has indicated that he always wanted to have some kind of a senior or old-hand presence here to interact both with faculty and students. I'm never sure how well that works out, but I spend lots of hours visiting with faculty members, and especially with graduate students. I think that's what Carl

wanted. Carl was and is a very astute observer of people, his ability to size up capacity and potential is amazing. I don't say that because of George Jemison or me, I say it because of the quality of some of his other faculty recruitments here.

HKS: In 1969 I wrote to Carl. I was finishing my Ph.D., and I asked him for a job. I wanted to teach forest policy. He wrote back to me, he said, you know the Forest History Society is moving to the west coast from Yale, and one of its potential sites is here in Corvallis. He said if the Forest History Society will pick up your salary half-time, I'll pick up the other half. So I wrote to the Forest History Society and introduced myself, that's how I got into the Forest History Society. We went to Santa Cruz instead.

REB: That's the way Carl operated. He oftentimes changed the rules of the game after you got here. I can imagine that later on he would have searched for ways for your salary to be paid by the Forest History Society. He was very imaginative about those relationships, and keenly appreciative about how important that affiliation would be to this institution. He was also a tough administrator. He could make some very hard decisions. But Carl also was sufficiently astute that he was generally right. He more than anyone else made Oregon State one of the leading forestry schools in the country.

HKS: So you're winding down on IUFRO.

REB: I will serve on the executive board as past-president for an additional two years.

HKS: Until the '95 meeting in Finland. Are there roles that you play in IUFRO after that?

REB: Minor or none at all. Are you asking what am I going to do next? I'm going to be a truck driver.

HKS: That's right, you mentioned that last November when I was here. You want to get one of those big belt buckles. And on that bit of insight, let's stop. Thank you for an informative and thoughtful interview.