An Interview With

R. Keith Arnold

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Contents

When Keith Arnold was director of forest protection research in Washington, D.C. during early the 1960s, I was an apprentice scientist in fire research at the Pacific Northwest Forest and Range Experiment Station in Portland, Oregon. Keith convened a workshop for Forest Service fire researchers in Denver; there I met him only briefly. Our next meeting was not in person; I had written a book on Forest Service history, and Keith reviewed it for *American Forests.* He liked the book, even praised it, becoming one of my favorite people. We met face-to-face in 1978 while he was president of the Society of American Foresters. As a student of bad timing I approached him for a minor favor, just as he was rushing to the bedside of his heart-attack stricken friend, Steve Spurr whose name appears frequently in this interview. Although obviously agitated, Keith tended to my request. And that's just how well I knew Keith Arnold when we began working by mail to construct an outline for the interview that follows.

In August 1992, Keith met me at the back gate of Hot Springs Valley, Arkansas, a retirement community included in four thousand wooded acres. His fine home is literally at lake's edge; we taped the interview in a basement area with a full view, and I was at times distracted by pleasure boats cruising by just outside the window. His wife was away, and we had the house to ourselves, which means that Keith fixed my lunch--twice. One afternoon we toured the lake on his boat, and I could begin to understand why people look forward to retirement.

Keith is an organized person. Not only did we have an outline, but he had prepared twenty-eight hand-written pages of notes to guide his memory. He was always amenable to any spontaneous follow-up questions that I had, but we pretty much adhered to the outline and his notes. He reviewed the transcript carefully, making corrections of fact and shifts of nuance. As you will read, his Forest Service career was not a traditional one.

Richard Keith Arnold was born on November 17, 1913, in Long Beach, California. He earned a Bachelor of Science degree in forestry from the University of California in 1937 and a master's degree in forestry from Yale University in 1938; in 1950 he would receive a Ph.D. from the University of Michigan. A four-year stint in the Navy during World War II, plus graduate school, plus teaching at the Berkeley forestry school, fairly well rounded out the 1940s.

In 1951 Keith began working in fire research at the Forest Service experiment station, also in Berkeley and in the forestry school building. During the interview I commented to Keith that I had difficulty sorting out when he worked for the Forest Service and when he taught at the forestry school--he was constantly on loan from one to the other. He confided that it was confusing to him, too, but nonetheless it worked well because the assignments were very compatible. The reader is thus cautioned.

One of his most challenging assignments was as manager of research team for the Armed Forces Special Weapons Project, a multi-agency undertaking. Central to the effort was the use of nuclear devices and the development of instrumentation to measure ignition and combustion at various distances from Ground Zero. Of all the scientific groups involved, Keith's forestry team was the most efficient and effective. An impressed military asked if he was interested in taking over similar instrumentation needs for their weapons testing in the South Pacific. He laughed as he remembered how the general's face fell when he learned that Keith's Ph.D. was in forestry, not nuclear physics. It was okay, though, Keith wasn't interested anyway. As noted above, his career has not been typical.

Keith was named chief of the division of fire research in 1954, and in 1957 he moved up to director of the station. He moved again in 1963, this time across the nation to be director of forest protection research in the Washington Office. Now he was responsible for research on fire, insects, and disease--topics that were intellectually unrelated but made sense to the land manager. He believes that these three moves resulted from him being "in the right place at the right time," a situation that would occur more often in his life than in yours or mine.

His career path took an abrupt jog in 1966, when he accepted the deanship at the University of Michigan School of Natural Resources, where he had earned his Ph.D. a decade and a half earlier. One of his goals was to make the school more important to the university, a process that became rather controversial with alumni and others. Here, he relates publicly for the first time what happened and why.

The next "right time" was in 1969 when Forest Service chief Ed Cliff called, asking if he would be interested in being deputy chief for research. It seems that there was an unexpected vacancy, and the chief was concerned that the secretary of agriculture would bring in an outsider. Apparently Keith was the only one with the necessary experience and credentials to quickly pass Civil Service muster for the position. He accepted the offer, and his career path jogged back to its Forest Service center.

Keith discusses and describes the budget process, testifying in Congress, relationships with the Agricultural Research Service, and minority hiring. President Nixon had announced that the 1970s was to

be the environmental decade, and Forest Service research responded in several ways including studying fire in wilderness areas and methods to manage natural areas. There were international issues to address and a need to achieve balanced programs. And there was more--much more--as he recounts what it was like to be deputy chief.

Another career jog in 1973, when his good friend Steve Spurr (who was also president of the University of Texas) called. Would he like to be director of the Division of Natural Resources? As it turned out he would, and soon he was a professor in the LBJ School of Public Administration. The word intrigue takes on fuller meaning when following Keith's account of life in Austin, which he nonetheless thoroughly enjoyed.

It was at this same time that he became active in the Society of American Foresters at the national level. He was president when a major bequest made it possible for the SAF to own its headquarters, and spiral downward into an extraordinarily divisive--and expensive--conflict. There were also antitrust implications in the Code of Conduct, which apparently restricted competition. The code was appropriately revised.

Finally, 1980 was the time to retire. But there were enjoyable things yet to do, and for a few more years Keith was visiting professor at forestry schools in Colorado, Oregon, Maine, and Arkansas. By 1992 he seems truly retired but is keeping busy with family, stepping off his front porch into his boat, and playing championship seniors tennis. He lives in Hot Springs Valley, he says, because it is half-way between Austin and Washington, and it was his favorite stop-over point for the many, many trips he made between the two towns.

Harold K. Steen
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Formative Years

Forestry Education

Harold K. Steen: Why forestry? I don't know what other options you were thinking about when you were in high school, but somehow you wound up in forestry.

R. Keith Arnold: I wasn't thinking of any career in high school as far as I know. Along toward the end, I guess as a senior and then in junior college, I came upon forestry, probably because my Sunday school teacher was a forester for Los Angeles country.

HKS: Is that right?

RKA: Yes. He was a young fellow and had graduated from Forestry School at U.C. Berkeley, Paul Gruendyke was his name. Paul took me to the Los Angeles county seed orchards and plantings. I got interested in the urban phase of forestry more, because I lived in Glendale at the time. We did a lot of tree growth measurements, and he said "obviously you're interested. As a very good student you might as well go to the University of California at Berkeley." One other possibility--and I think this did have a lot to do with it--my folks had a cabin at Big Bear Lake, which is just north of San Bernardino. I spent every summer there from age one until I was old enough to work. I thought that was probably one of the best forests in the entire world until I found out later it was between site 4 and site 5 [laughter] ponderosa and Jeffrey pine. I guess the third reason, and this is not very important, is that my father owned a retail lumber yard--my grandfather also was in the lumber business. I worked there in the summers. That was when you unloaded box cars and flat cars one stick at a time. I did a lot of lumber bucking. I don't know whether that made me think about growing trees that were lighter weight or not, but it really was Paul Gruendyke as a forester for L.A. county who did the trick.

HKS: When were you at Berkeley in forestry?

RKA: I went there in 1935 and then graduated in 1937. I went to junior college in Glendale, and I think it was fortunate to have gone to junior college because they did a better job of teaching. I'm a strong advocate of junior colleges. At U.C. Berkeley I had no problem getting through with high grades while working most of the time.

HKS: I have a cousin who graduated from the University of Washington forestry school in 1937. He never worked as a forester because he couldn't get a job and he wound up teaching school or something. What were the jobs like then?

RKA: There weren't any. I think our class had thirty-five or thirty-six graduates, and not a single one of them got a job in forestry. The closest one was John Zivnuska who worked in the Border Patrol out of New Mexico. John worked down there for a year or two before he finally came back to California and forestry. When the job situation opened up, most of my classmates went into the California Division of Forestry. I probably would have done the same, but I was at Yale when state jobs became available. We'll talk about Jim Mace later on, but in forestry camp, which came after the junior year at Cal, he and I ran for camp manager and he won by one vote. But the students also voted that I would get my way paid, and so I worked for Jim Mace as assistant manager of camp, which meant that I organized all the work details. Jim made this statement the first day in camp, he took me out in the woods and said "this is going to be the best run camp that has ever occurred up here. Even if you and I flunk, we're still going to do a good job." Jim pursued that career goal all through his work with the California Division of Forestry.

HKS: Were you at all surprised that John Zivnuska went on and became the eminent economist and all that?

RKA: No.

HKS: He was good in school?

RKA: John was very smart. I'd better wait and tell you about John when we get to my teaching of forest mensuration as a graduate assistant.

HKS: What were the options at Cal? Forest management, logging engineering or what.

RKA: There was just one curriculum, but you could specialize in watershed management, forest production, engineering--Emanuel Fritz taught engineering. Principally it was a fairly conventional curriculum in forest management.

HKS: When you were an undergraduate did you assume you were going on to graduate school?

RKA: No, I didn't consider it at all. I guess I might as well admit that I had a straight A average at Cal, and several of the profs said that I should go right on to graduate school, but I was ready to get out and go to work, hopefully in the woods.

HKS: Sure.

RKA: But when no jobs came up, I applied to Yale and received a scholarship. I was the teaching assistant at Cal's summer camp that year (1937) after graduation, and then went on that fall to Yale toward a master's degree.

HKS: You have on the outline that Walter Mulford was a major influence in your life. Was it because he was dean or was it because he was an influential guy?

RKA: It was for both reasons. I guess principally because he was dean and because he gave me several opportunities through my career that I'll have a chance to mention. Walter was involved almost entirely in recruiting top professors, building a strong school in a large university, and being accessible to every student all the time. He gave me jobs later on as we'll see. He was not heavily involved in forest policy outside the school, but his history and forest policy courses were tops. Yale was a little different. A professor at Cal who had graduated from Yale said that Dean Henry Graves would take on two students each year, and give them each an individual course with him for three units. I decided I wanted that, so I went to Yale two weeks early and met with Dean Graves. You had to pick a subject of his interest. I'd been advised that he was chairman of the Parks Authority in Connecticut. I told him I would like to take a seminar in Forest Recreation. It resulted in a paper on forest recreation, its planning, development, and projections. He was the best editor I've ever worked with. He edited the *Journal of Forestry*, years and years before, and it took me three weeks, I remember, to get my first page through him. [laughter] This obviously was among the few best courses I ever took.

HKS: Forest recreation. That was not a typical subject in those days.

RKA: No, it wasn't. He was ahead of his time. He could see it coming and he was interested in balancing recreation in forests with other uses; so that's why he headed up the Connecticut parks and recreation program.

HKS: Tell me a couple of anecdotes about Graves. The ones that you read from his contemporaries are about his coal black eyes. His eyes, I guess, dominated the situation. What it is about Graves that made him so great?

RKA: That's a difficult question. He wasn't at all "stiff" when you were one-on-one with him. His laugh would echo throughout Sage Hall. I don't think there is any question that you described his actions and appearance perfectly. He was extremely friendly, and it was easy to exchange information with him and to argue with him, but he appeared in public to be quite formal. He really gave two students a year a special education. It was worth the whole Yale experience. I believe Henry Graves' greatness stemmed from his forward-looking capacity--some thirty to forty years.

HKS: This was a guy who was Pinchot's assistant. Did he have any sense of that history?

RKA: I am sure that he did but he was looking at the present and the future--at least with me. Gifford Pinchot came up a couple of times during the year and gave a seminar for the students, but other than that I didn't get any special sense of history. H. H. Chapman emphasized history in his management class. Of course there are endless stories about Chappy: how he blew his auto's horn at every intersection; how he walked out of a hospital with only a gown on; his weekly battles with the secretary of the interior. At one of his 8:00 a.m. lectures he kept his heavy overcoat on. We learned later that he had forgotten to put on his suit coat. No Yale professor would lecture in his shirt sleeves.

HKS: I suppose some of them are even true. Pinchot was rather elderly by then. Did you go to those seminars or presentations that Pinchot made at Yale?

RKA: Of course.

HKS: Did he have a strong personality? I'm curious about people who are in leadership roles.

RKA: Yes. Pinchot was plain tall and extremely forceful is my recollection. He obviously was old at that time. Now I would not consider the seventies as old. I guess we could figure out how old. He projected a sense of very strong persuasions and rather antagonistic approaches to problems.

HKS: So you had that short course from Graves. What other sorts of things did you study at Yale? The basic master of forestry program?

RKA: Other than Graves I didn't gain a lot with the year that I was at Yale. It was not the program's fault. It was quite duplicative of the curriculum at California.

HKS: Is that right?

RKA: It should have been obvious, because it was the general forest management course, and some of the people in it were in the two-year program. If you had an undergraduate forestry degree, you got your masters in one year as you may know. The two-year program produced the same master's degree for those who had a degree in some major other than forestry. As I look back, I didn't get anything new except for contacts with professors such as Graves and Chapman. I enjoyed the Yale summer camp in the southern woods at Arkansas more than any other part of the program at Yale.

HKS: So now you have a master's degree. What were your thoughts, by now you're sort of getting in the swing of things; you're looking ahead at more academic situations, right?

RKA: No, I was looking for a job at that time.

HKS: Still looking for a job?

RKA: I finally received two very different job offers just before the end of the spring camp in Arkansas. One was to stay on as an area forester at Crossett Lumber Company. We were on their lands with the Yale camp.

HKS: We're about what, two hundred miles from Crossett here?

RKA: Yes, approximately. The other offer was from the California Forest and Range Experiment Station--a field assistant's position at Pinecrest, about seven thousand feet in the High Sierra. As a native Californian, it was an easy decision for me to avoid the chigger-infested woods of the South compared to the beauty and challenges of the Sierras. So I did accept that job as a field assistant, and it lasted for about a year and a half. The work at Pinecrest was under Duncan Denning, who was probably the finest ecologist and silviculturist to be found in the United States. I know that's a strong statement, but I spent a

lot of time in the woods with him. He was the division chief for Forest Management Research. He was a poor administrator. He didn't like administration. He and Ed Kotok, the station director, did not get along. The Forest Service lost not only a good scientist, but experienced poor administration. He retired early out of frustration. I had a chance to help eliminate that kind of a problem twenty years later when I was station director in Berkeley. The second year at Pinecrest was even better. Along with fishing and hunting, it appeared to be an ideal job. Director Ed Kotok used the Stanislaus field station for weekend rest and recreation. He was there quite often. One evening after a rather lengthy happy hour, he confided in me that I just wasn't the kind of person for Forest Service research. He advised me to move on. Sure, he says, you can do this field work all right, but I don't think that you will go far in the Forest Service. At that point I had never considered an advanced degree or more academic work. Guess I have to give him the benefit of the doubt and thank him for the right advice at the right time.

HKS: Did you have a sense of what he was referring to? Your lack of training or just your attitude or what. Why do you think he said that?

RKA: I don't know, I thought about it at the time and never have determined whether he was firing me or directing me back to academics.

HKS: Because research in those days wasn't very rigorous. I mean to not have a Ph.D. wouldn't have been a major deficiency would it?

RKA: No, no there were rather few Ph.D.s in forest research, and maybe he sensed that I should have a Ph.D., I don't know. But anyway, this was in April or May. In August I enrolled at the University of California economics graduate study and became a teaching assistant in forest mensuration during the school year and at the forestry camp in the summer. Thus began the work toward the Ph.D. received some ten years later.

HKS: So your Ph.D.'s from Berkeley?

RKA: No. I had about 2/3ds time available for Ph.D. work. The rest of the time I was a teaching assistant as well as working outside some for the Forest Experiment Station. In January 1942, Percy Barr, who taught forest mensuration, was a colonel in the army reserve. He was called up suddenly and left with no one on the faculty to teach his courses. Dean Walter Mulford asked me to teach mensuration. Here's an example of one of those many unique breaks I have had by being at the right place at the right time. So I taught mensuration in the spring of 1942 and then filled in for Percy Barr's time in operating and teaching the summer camp. The Navy caught up with me in July. The Ph.D. was on hold obviously for the four years of military service.

The War Years

HKS: Did some of the training you had in the military apply to your later life?

RKA: One day I was in summer camp checking out student field work, the next day at eight o'clock in the morning, having driven all night, I was a naval officer and by two in the afternoon I was in full uniform. My orders directed me to Dartmouth for a two-month indoctrination course. There was no one to teach navigation so we had no contact with that critically important part of naval officer's training. My first orders were to go to Cornell. I think they looked at my teaching experience and the fact that I had taught surveying and so here I was ordered to Cornell to teach navigation.

HKS: Did you feel qualified?

RKA: I didn't know anything about the textbooks or the subject. When I went to the commanding officer I told him I had never had any contact with navigation in any way. He said well we have a top man that used to be at the Naval Academy. He'll teach and you just go in and go through one session. We have one-month courses here, and you can start teaching in a month. So the next day I went into the classroom; the teacher didn't show up. So after about fifteen minutes I got up and started talking about

the world is round and there's latitude and longitude and a few things that I knew. The man who was supposed to teach it had a very serious emergency appendectomy. He was in the hospital for three or four weeks, so I taught navigation. I could handle everything by heavy reading the night before. Celestial navigation was different, and I needed help. I went to the hospital every day, got briefed and then went home and studied the books and gave the lecture the next morning. We had two men who were yachtsman with much navigation experience. After my first lecture on celestial navigation, they both came up and said "Lieutenant Arnold we'd like to congratulate you, that's the simplest explanation of celestial navigation we've ever heard." I admitted that the lecture included the sum total of my knowledge on the subject. I applied for sea duty after about a year and was sent progressively to anti-submarine warfare school in Miami, San Diego, and finally Boston at the anti-submarine warfare instructor's school. I taught there for a while, but was transferred to the staff of the commander of the Atlantic fleet where we did sea-going tests of new equipment, wrote training and operating manuals, and worked on special assignments. I was one of the few who worked on the methods we would use to capture the U-505 now in the Museum of Science and Technology in Chicago. You may have seen it.

HKS: No, I haven't.

RKA: That advanced German submarine was captured by a plan that was developed in advance. I had some good experience in the Navy in writing briefs and training manuals. I got to sea half a dozen times, usually with new equipment to test. We did not simulate; we worked in the North Atlantic in real-life situations.

HKS: There's something about either the luck of your life or some temperament you had that you tend to wind up doing research and teaching rather than this other sort of thing. They could have sent you out there with depth charges, but instead you were doing research and writing manuals.

Graduate School

RKA: But it wasn't because I'd asked for research and training. Sometimes we had the depth charges also. After the war I knew I wanted to go ahead and finish work on my Ph.D. But when I returned to Berkeley, I found that I'd forgotten a tremendous amount, I almost had to start over in economics. Again Walter Mulford gave me an appointment as associate in forestry. I taught fire control and was responsible for operating and teaching summer camp. This was supposed to be done in half of the time with the rest available for study toward the Ph.D.

HKS: I suppose to the extent that there is an advantage to war, during the four years you were in the service there wasn't a whole lot of new knowledge being generated in the civilian ranks, so you didn't fall behind that much.

RKA: No, but never having given economics a thought for four years, I had to take graduate seminars over again. It became obvious after three years that I probably would not be able to get my Ph.D. at Cal. There is no such thing, as you probably know, as a half-time appointment, there's always more that comes up. I had a family at that time of two boys and a wife. We decided to go to Michigan for a Ph.D. Sam Dana was on my Ph.D. committee; Shirley Allen was its chairman. My Ph.D. thesis was related to fire policy with emphasis on economics. I think the most valuable organized course I ever took in any university was in group dynamics. I needed units outside of forestry and economics to provide a rounded base for Ph.D. This was an excellent course for future application--how to work with small committees, how to work with large groups, how to recognize all kinds of leadership and the roles that needed to be played. I think I was able to apply those techniques in every day work from then on. Even though my Ph.D. work was in the economics of forestry and fire control, almost all of the research and work in the early years were in the field of meteorology and the physics of fire behavior.

HKS: How did you get involved in fire?

RKA: I grew up in the middle of fire. In southern California, I remember as a boy we had the hose up on the roofs several times keeping the house from burning when nearby brush fields were burning. Also my

teaching assignment was in fire control. That left no choice. I had to learn a lot about fire in a short time. Probably the most important part of the Ph.D. thesis was the title. It was called the "Economic and Social Determinants of an Adequate of Forest Fire Control." Now that even sounds like a good thesis.

HKS: That sounds like a dissertation to me.

RKA: I believe that was the first Ph.D. thesis related to fire. That doesn't mean anything except that there was nothing to go on. Show and Kotok did some pioneering studies in fire control policy in the 1920s. Like flood control and earthquake damage, there is no way financially or organizationally that we can be prepared for the ultimate disaster. You can plan fire control in an economic and financial planning situation up to the level of what you might call a conflagration. The Yellowstone fires are good examples of that sort of thing, there's just no way that you can put together a program to have any affect on those major fires, it just can't be done.

HKS: Was this controversial? Did people disagree with that, people in fire control?

RKA: No, I haven't found anyone to disagree with it. You can't get that kind of money and even if you did you're not sure. The flood is a perfect example. The Army engineers' flood control programs in the country are designed to take up to, let's say, fifty- or a hundred-year floods, I don't know their criteria. So over long periods of time they have adequate flood control, people move into flood plains, businesses move into flood plains. Then comes a five hundred- or thousand-year flood and wipes out everything. It's identical in fire, and we can't build the buildings to withstand the worst earthquakes. They're designed to stand up to some, but at some point in time an earthquake will be strong enough, it will destroy them. The only answer in fire control is a vigorous program of prescribed fire. It applied in wilderness areas and national parks, conflict is obvious. As an aside, the Yellowstone fires would undoubtedly have occurred, unless there had been an aggressive prescribed burn program for the past fifty years. The existing "let burn policy" was inadequate: "if lightning started a fire in certain areas of the park, it was allowed to burn." There was no tie to fire danger rating or to long-term drought effects. I have a long-standing position (certainly controversial) that if conditions for burning allow a lightning fire to be allowed to burn, we could set a prescribed burn at the same time and place.

HKS: Tell me about Sam Dana. I met Sam once, spent a delightful lunch with him about two years before he died. He was old then and rather frail, but certainly a leader of forestry.

RKA: Sam was the personal confidant on forestry to four or maybe five presidents of the United States.

HKS: Is that right?

RKA: Yes. I got well acquainted with him during my Ph.D. work. Let's talk about Sam when we discuss my deanship at the University of Michigan. After I finished my Ph.D., unbeknownst to me, he told the chief of the Forest Service and others that if the Forest Service ever needed a research director in the future, they ought to look at me. That came home to roost about six years later I guess.

HKS: Sam was an excellent teacher?

RKA: Yes.

HKS: I asked someone else the same question, why was Dana so influential? A lot of people know a lot about forestry, and they're smart. They said because Sam would come to a meeting and always have a one-page proposal. No one else had prepared, so his proposal became the argument point. He controlled it, not in any malicious way, but he knew what it took in group dynamics to get things accomplished. Is that a fair anecdote about him?

RKA: Yes, it is. I think more than that he was always twenty years ahead of his time, and I'll talk about that later. I think he had the mental ability to solve almost any problem. It got so that anytime that I prepared a paper I would send it to Sam for review. Maybe he'd even mention an idea or two, but he

would edit in a professional fashion. I remember one paper I wrote. I sent it to Sam and back at the top came these words, "You can do better than this, Keith." [laughter] So I threw it away and started over. I think I'd like to talk more about Sam from the viewpoint of dean because that shows his kind of thinking and how he operated.

HKS: When you're doing a Ph.D. in a relatively new field as you were then, what's the faculty role? Just somebody to react to? Because they didn't have any expertise, there wasn't any expertise at that time.

Early Years Teaching and Research

RKA: No, but the basic economic analysis was standard, and that often happens in the Ph.D. field. The candidate may or should know a great deal more than the people on his committee or her committee.

HKS: Were the data hard to come by?

RKA: No, the data in national fire reports and reports of the chief were adequate. After finishing the Ph.D., again Walter Mulford hired me back at Cal as assistant professor.

HKS: You and Mulford got along pretty well it sounds like.

RKA: Yes.

HKS: He was a Yale graduate, was he?

RKA: I don't know.

HKS: Okay, it doesn't matter. Looking at the outline that we've agreed to, you've bounced back and forth. As a matter of fact, I can't quite sort out the line between teaching at Berkeley and work at the experiment station in Berkeley. Maybe as we go through your narrative here, we can pull that apart.

RKA: I can't pull that apart either. It varied so much and by so many different amounts. Sometimes I was full-time at the experiment station on leave from the university; sometimes I was full-time at the university but still doing research in cooperation with others at the experiment station; sometimes half and half. I have no records of dates when I was doing one thing or the other.

HKS: When you were teaching at that time, were the majority of the students returning GIs? You had large classes and they were dedicated, they worked hard and were ready to learn a profession, no goofing off.

RKA: No, it was the other way around.

HKS: Is that right?

RKA: Particularly at summer camp. They'd had two, three, or four years of discipline and they were ready to relax and have a good time. They were not uniformly good students, only by their own choice. In fact I had the first forestry summer camp in 1946 after the war, and we had two revolutions up there where they tried to get rid of me as a prof because I was insisting that they do some work. But most of those people got through and became top-notch foresters. They've been my good friends ever since.

HKS: Was the link you had with the experiment station relatively typical for Berkeley faculty? In that various professors had sort of a joint relationship?

Armed Forces Special Weapons Project

RKA: Many of the younger ones did. I think John Zivnuska did, several others had cooperative projects with the station because the station had experimental areas and experimental forests and some of the

profs would go up and do their field work at experiment areas of the Forest Service. After the Ph.D. work, I was an assistant professor at Cal. My work with the experiment station became, as you mentioned, confused. I worked both with them as an individual employee and cooperatively. The first project that came on was the Armed Forces Special Weapons Project. This was a contract that the Forest Service took to determine the effects of nuclear weapons on forests. The military wanted to do it to know what the trafficability problem was. If nuclear weapons were detonated in forests, could tanks go through, could automobiles go through? What kind of effort would be needed to clear roads and that sort of thing. They were also concerned with the fires that would ensue after attacks. Again the timing for me was fortunate. I didn't know anything about this subject. Apparently the Forest Service couldn't find anyone in-service that they wanted to release to head this project. It had some top engineers and physicists. They asked me if I would take leave from the university and run this project, and I decided to do so. We had two areas of study. One was blast effects. We organized and did wind tunnel tests on small trees to know how much wind it took to break them or blow them over. We outfitted trucks to drive down highways at fifty miles an hour with a small tree maybe twenty feet tall, fully instrumented, standing upright on it. We developed a standard metal tree that we could put out at the nuclear test site in Nevada. It was supposed to react like trees and served to see what the difference was between the atomic blast and a steady stream of wind tunnels and trucks. We finally ended up moving a three-acre stand into the Nevada proving grounds. Every ponderosa and Jeffrey pine was instrumented to measure deflection. We developed a worldwide prediction system based on type of tree and age, etc. We recorded how many of these trees would break and how many would not. Our results were satisfactory, our predictions were quite accurate.

HKS: I remember seeing photographs of the same time period. Houses were built to test how far away from ground zero the house would be obliterated or just scorched or whatever. The same kind of testing but for forests.

RKA: Those houses were provided and that contract work done by the Forest Products Laboratory in Madison, Wisconsin. We studied ignition points in forests and in buildings. The fire effects gave us a chance to again study conflagration fire and ignition patterns in fire storms which went back to my thesis work. There was no question that the kinds of things that were ignited by the small atom bombs were the fine fuels such as grasses. The most common forest ignition point was in rotten woods. If you have a forest with a lot of rotten wood in it you'd get many ignitions in the rotted part of the wood. In houses you get ignition on curtains. You can have a whole side of a house burst into flames, but as soon as the bomb heat dies that would go out, it wouldn't hold. As a follow-up to these field tests, we did a survey of Detroit and several other cities in the United States to determine fire patterns. We looked for ignition points in houses and developed some prediction systems on how large areas fires would be started. We studied the fires in firestorms in World War II, which gave us some good insights on how they would behave after they started. We also developed a rather simple world-wide fire danger rating system. This work was interesting to me; it gave me a practical insight into very large fires. There must have been a thousand people at one time out at the Nevada proving grounds, doing different kinds of weapons effects tests. I think foresters stood out, because we were accustomed to working in uncontrolled environments in the woods. Most everyone there was a laboratory scientist. They had trouble working with wind, rain, and humidity. We went with our own tools, our own automobiles, we were completely self-contained and looked very good as our field tests had few failures. I can think of one story that comes from that experience. We had nothing to do with the bombs, but after every detonation based on what happened to our materials we had to indicate what we thought that the bomb yield was. The first time they detonated a bomb about eleven o'clock in the morning was the first time it hadn't been at the highest dew point. The fine fuels and some of the materials exposed from other units had been always moist. When they detonated this bomb at eleven o'clock in the morning, the entire desert vegetation and some experiments for half a mile around went up in flames. As we were giving our reports everyone said this had to be a bomb with greater heat intensity than had ever been before. We looked at our ignition and spread table related to humidity and said the bomb tested was the same. This leads to one story which may be a little meaningless. One night I was been asked by Colonel Diller, our program manager, to come to meet with five or six people. They talked around a little bit about that there was going to be a test of a larger weapon in the Pacific area. They wouldn't tell me what it was, but they said they needed a test director and was I interested in being considered as a test director for this site. They said it'd take me six or eight months out in the Pacific, and I said I couldn't stay away from my family for that long. It was just not possible. One of

them said Dr. Arnold, is your doctorate degree in physics or in electrical engineering? I said it's in forest economics. There was a dead silence in the room, and pretty soon they started walking out. [laughter] I didn't hear anything more about what is now known as the first hydrogen bomb test. I did learn quite a bit about research administration and it gave me a chance to study conflagrations and fire storms.

Operation Firestop

Jim Mace, who is probably my closest long-time friend, was the deputy state forester for southern California. Jim was probably the best forest fire general in the business. Of course in southern California you have plenty of opportunity to demonstrate that. He had been invited to Palmdale north of Los Angeles where they now land the spaceships. He had been invited by Donald Douglas to look at flight tests of the DC-7. They were flight testing it with tanks of water in it to simulate loading and distribution of passengers. When they finished they wanted to get rid of the water, so they just flew around the desert dropping water out of the plane. This was Christmas Eve of 1950 by the way. Jim stopped on his way home, called me long distance and said that we're going to have air attack on forest fires. I said that's a good idea. He said and you're going to organize it. He says it's going to take a Ph.D. During that year we made plans to fight fire with chemicals dropped from airplanes. That had been tried with water in the early 1930s, but they did it with bombs. They filled bombs with water, and the bomb explosions would cause the fire to spread so that there was not enough water to put out the fire. The net effect was more serious fire situations.

HKS: And you used crop dusters, too, very small quantities of water.

RKA: That came during Operation Firestop, which was the name for the one-year research and development program.

HKS: Okay.

RKA: Conventional wisdom said that air attack on forest fires would not work. We had fifty thousand dollars granted by Federal Civil Defense. That was the only direct funding. Everything else was contributed; my salary was contributed by the university. The entire fire research unit of the California Experiment Station was donated with Charles Buck as the scientific and testing officer. I was responsible for the organization and direction. We had help from Los Angeles County. The state moved an entire Conservation Corps camp into Camp Pendleton where we did the field testing. Region 5 of the Forest Service provided aircraft or personnel. The Marine Corps provided helicopters. We had twenty miles of bulldozed fire lines in there and we burned about two hundred test fires. We started out looking for retardants that could be dropped. We found from laboratory testing that just about any common fire retardant could be used. Most were more effective than water. We had an overhead sprinkling system on tracks to run tests on small fires. We learned that you had to get four to ten gallons of water on one hundred square feet of brush to do any good. If you didn't get that much on there would be little effect. The problem in southern California is that water dropped during hot and windy days evaporates before it has any effect. We had tests of water drops to measure distribution. We found that with the World War II torpedo bomber we could treat an area fifty feet wide and two hundred and fifty feet long with two hundred gallons. We also tried it with helicopters. Water and dissolved chemicals would just evaporate too fast. If you delivered it on the very edge of the fire, it would knock it down for a few minutes, but almost immediately the fire would flair up again. At the last test we were using sodium borate as a fire retardant. We didn't have enough to complete the test, so they mixed it with calcium chloride. That made it kind of a thick, gravy-like slurry. When that was dropped in front of a fire, it clung to the branches and the test fire just up and stopped. Talk about luck.

HKS: Sure.

RKA: The Monsanto Chemical Company and the Pacific Borax Company said that sodium calcium borate was readily available. They dug this up in California, to use as a slurry for weed killing along railroads. They delivered the mix; we ran more tests and found we had an effective agent for air attack on forest fires. Only crop duster planes were available. They could drop one hundred gallons. They used this

sodium calcium borate, and that's why they were called borate bombers. We found out later that we could thicken almost any fire retardant with a chemical that came out of seaweed, it's a common thickener, I don't recall what it is. So from that time on air attack developed rapidly. Forest Service equipment development centers designed the boxes or bomb bays that would give the proper four to ten gallons per hundred square feet and so forth. Many other common chemicals could be used as long as they were thickened.

HKS: Kelp, I think they use that for thickening ice cream.

RKA: The Canadians about the same time used our free-fall liquid drop from float planes. Their fires do not usually burn as hot as those in southern California. It's cool enough for water effectiveness. They would scoop up the water from lakes without stopping the planes, drop it and come back for more water. Although they'd use chemicals, they've had success with just plain water drops. Of course now it's completely operational, there are very few big fires or fast moving fires that don't have water or chemical attack from the air.

HKS: This is not Operation Fire Stop you're talking about is it?

RKA: Yes, this is Fire Stop. And it came because Jim Mace saw the drop from the DC-7 flight test.

HKS: In my mind's eye I have a recollection of you someplace around Bakersfield or somewhere piling branches and stuff to try to create a nuclear attack or explosion in terms of the amount of heat. That goes back to this special weapons project?

RKA: Yes, that was the study of area ignition--the kind of fire pattern that results from nuclear detonations. I think I know where you saw it. One of my early cooperative projects with the experiment station was the use of fire in land clearing. In other words how to develop prescribed burns that you could make safe enough for California conditions. We took areas that wouldn't burn normally, because the fuel was either so sparse or damp that it would kind of smolder along. There must be a clean burn if you want to clear the land or reduce the hazard. We made multiple simultaneous ignitions and called it area ignition. There is a report that indicates that area ignition can be used in some cases. I do not remember piling fuels for the tests.

HKS: I got you off the track on Operation Fire Stop.

RKA: No, I think that just about takes care of Operation Fire Stop. It was more trial and error than research per se. We tried a lot of things. We tried laying hose lines across mountains with helicopters. We even tried wind machines. They were a disaster, because the wind machine would create eddies and you'd have fire around behind the wind machine fairly soon. But the air attack using chemicals did succeed. I think the amazing thing is that if we had had financing for the entire period, the cost would be in the order of a million dollars. We did it with fifty thousand and contributed personnel and operations.

HKS: I suppose the availability of surplus military aircraft made a lot of things feasible then. They're relatively expensive to acquire if not to operate.

RKA: Yes. At that point the crop dusters were doing chemical drops in a different way. By just changing the figuration of their outlet valve they could work pretty well. They did most of air attack for seven years, and it was amazing how successful they were.

HKS: What happens back at school? You're always off doing these things. How about your students?

RKA: The fire course was only one semester. A teaching assistant took some classes. I flew back to Berkeley for most of them. It must have been a lousy job of teaching, I'm sure of that. But more about teaching fire. I was inexperienced except for my economics study. Charles Buck, who was division chief in fire for the experiment station, was probably the best fire behavior expert in the country. He knew more about it on a scientific basis. He spent ten to twenty hours a week with me when I first started teaching

fire. I went on as many fires as I could and attached myself to the most experienced crew boss I could find. Many of these old timers would have fought fire on the same area several times. Between Charles Buck and the work with practical experience, I became a fair predictor of fire behavior quickly.

HKS: I'd never participated in any fires in California, but I fought some in the Pacific Northwest, very heavy fuel loads. The fire didn't move very fast but it sure did a lot of damage as it went along. But there everything was the weather. You sort of played with the fire until the humidity went up high enough. Is it basically the same everywhere that the weather is the controlling factor? Or can you really put a fire out?

RKA: Well, when you control a fire, you control a perimeter and let it burn out. The weather, particularly wind, is extremely important on an hour by hour basis. Fuel moisture has slower effects but is usually the determinant of how hot a fire will burn. A good example comes from the Yellowstone fires. The weather was bad but it was the fuel moisture of three years drought that dried out all the heavier fuels. Normally, in an ordinary fire maybe the tree and branches up to the size of your thumb may be the largest that will burn, or maybe even the size of your wrist, but they had trees up there twelve, fourteen inches in diameter that were so dry and even dead that they almost exploded.

HKS: The current five-year drought in California. Something is going to happen out there pretty soon.

RKA: That's why we developed a sense of conflagration potential. You're looking at the amount of the fuel and how dry it is. The very fine fuels, the grasses and herbs, they change fuel moisture on the hour. It's the larger fuels with moisture change over years that are critical. If the larger fuels are damp, the fire is easier to control. When the larger fuels are subject to long-term drought, you get conflagrations.

HKS: So Fire Stop was certainly successful. I mean you developed a body of very practical knowledge?

RKA: We got air attack started, and from then on it exploded and became operational almost overnight on small aircraft.

HKS: What's the date of this?

RKA: Early fifties, 1953 was the year. We had four months of field tests in the marine base of Camp Pendleton. Ten families moved to San Clemente. The state of California moved in the Conservation Camp. We had bulldozers from Los Angeles County as well as fire trucks and other equipment. We had two military Marine Corps helicopters. How we got all that together was largely Jim Mace's doing. Then we had to organize them all and keep in touch. Los Angeles County was a very strong contributor.

HKS: So by now you're becoming rather an authority on fire.

RKA: No one becomes an instant expert on fire.

HKS: Is this about the time then you actually moved into the experiment station or are you still teaching and doing research?

Chief of Fire Research

RKA: No, right at the end of Fire Stop, I was in my university office. George Jemison dropped in one day and said that Charlie Buck was leaving and would I like to become chief of the division of fire research in the station. I told George no. I said I think I'd kind of embarked on this career of teaching and research and I'd better stay here. And he said well think it over and let me know in a day or so. I called my wife and told her. Thirty minutes later I called my wife back and said if it's alright with you I think I'd like to accept it. She said I've just been waiting for your call, I knew you'd accept it. [laughter] Fire Stop was just finished, and we had very strong cooperative relations with all fire control people in the state. There was a need to apply a lot of the information that was then in research, and as division chief, I did a lot of advanced training related to fire behavior, not fire control technology. We still had no major funding for fire research. We only had a scientific staff of four people, which was a little ridiculous for California.

HKS: Did any other stations have fire research?

RKA: The Northern Rocky Mountain Station had a strong fire research program, and there was fire research in the South, particularly dealing with prescribed fire. We put out all kinds of information and propaganda trying to get increases in fire research. But we can thank the Rose Bowl for getting us our major increase. Several days before New Year's Day there was a fire in southern California that looked like it was going to destroy the TV cable to Mt. Lowe. This was before they had electronic means of shooting signals around. If that cable were destroyed there wouldn't be any TV for the Rose Bowl. That brought the attention to enough California legislators and congressmen and maybe some others. We were able to get a million dollars for a forest fire laboratory and a sizable increase in fire research.

HKS: That's the lab at Riverside.

RKA: Yes, that's the lab at Riverside, that's how that got in.

HKS: I would have thought that the need for fire research would have been obvious.

RKA: It was in terms of losses. I'll bring up the problem of financing in California when I became a station director.

HKS: Now you've left the university. Was the experiment station on the campus?

RKA: Yes. The experiment station was on the campus in the forestry building. Part of my job as director a few years later was to move it off campus. We met with university people every day at coffee hour; it was a very close working relationship. Experiment station scientists were used in teaching and gave many individual lectures. It was an excellent arrangement for both the school and the California Forest Experiment Station.

HKS: You're trying to get money. How do you pick the topics to study? Is it easy, or is it launched in debates, committee meetings?

RKA: In every research project you have a project analysis which analyzes the problem itself, the whole thing. It tries to identify the places, the missing links in knowledge and the effort that might make a difference in whatever the subject may be, whether it's regeneration or genetics or fire control, etc. Then with some priorities studies are listed in order of importance, the administrator adds some dollar signs and hopes to receive additional financing. Some project analyses took as long as two years to complete, and they weren't just haphazard guesses. Some of them were excellent scientific papers in their own right.

HKS: A project of any significance would, in effect, be approved by Congress during the budget session, right?

RKA: Yes, they would approve an increase related to that area and for that purpose.

HKS: When the deputy chief is defending the budget, explaining the good work that's going to come, they talk about the specifics of research at the field level in Congress.

RKA: That's right. I guess we have to be honest. You'll have maybe five or six research alternatives, and if the number two or three approach is much more saleable (the number one approach may be basic research), you're going to push number two or three rather than number one. That's rather obvious I think. I was never bothered by that process. Normally, and quite often, if you do get increases for number two or three, then number one comes more easily. If it's true research, you don't solve the problem. I mean it's rare that you identify a problem that you can solve in one year or two or this sort of thing. It's an improvement of knowledge for later application.

HKS: At that time would you be recruiting a physicist to study the physics of fire or were they foresters that somehow were interested in fire?

RKA: Physicists, meteorologists.

HKS: So it was already pretty sophisticated?

RKA: Yes. In fact some of the early people in fire research, even before we got the Ph.D. level, were physicists and engineers. George Byram was probably the most intelligent man in fire research. He was a physicist. Wally Fons of the Cal station was an engineer. George Byram developed the concept and application of fire danger rating very early. Project Sky Fire in Missoula was replete with meteorologists.

HKS: Did you draw upon the manpower available from the fire control folk at the regional office for some kinds of studies or data collection?

RKA: Oh yes, we got quite a bit of help there and from the State Division of Forestry. Carl Wilson who became division chief when I left, came directly out of fire control on the Angeles National Forest. But Carl's job was principally application and development.

HKS: I met Carl once. I worked in fire research at PNW. You and I met in Denver in about 1964 in a workshop when you were in the Washington office. But I remember Carl coming up from California, we went out and looked at some slash burning with him, he was intrigued by it. Region 6 was burning its slash better than Region 5 was and he wanted to know how come. Anyhow, you were there for four years. That's a pretty long tenure for you so far to stick at the same job.

RKA: A lot of my best friends say I never could hold a job for longer than three years. Fire research continued, and we developed one other idea. The CCC during the depression had put in fire breaks all over southern California. Fire breaks were common, but they were extremely expensive to maintain.

HKS: Sure.

RKA: Because in California in eleven years the brush grows back. Whether you burn or bulldoze the land it's normal chaparral in about eleven years. In fact in three to four years it can burn again. So we developed the concept of fuel break, which was to not leave the area barren. Of course it also eroded when it was barren, and that caused difficulties in the streams. We tried planting either a fire resistant vegetation or just a fine fuel, just plant oats or rye or something like that, plant them on the fire break, and then you could create an instant fire break by back firing. It's been used successfully in California ever since. It's been a fair contribution toward improving fire control in California.

HKS: Were you intrigued by prescribed burning as a way of reducing fuel load at that time?

RKA: Yes.

HKS: Did you have projects going?

RKA: Well, one of the first research projects I ever had was the use of fire in fuel reduction. It was cooperative with the state of California and with the experiment station.

HKS: I talked to Bob Buckman just two weeks ago. He made an observation, we were talking about fire; they've got some severe fire problems in eastern Oregon. Fire's been excluded for so long and they really have a tinder box ready to go off. He was saying the fundamental problem he sees in the use of fire is that the penalties for bad judgment are far greater than the rewards for good judgment, so a prudent manager will stay away from fire. Because statistically it just doesn't make much sense. Without trying to make you debate Bob Buckman, is that essentially a true statement? Is that part of the problem with fire?

RKA: It is in the West. The penalty Bob mentions is the conflagration fire concept in my thesis. In the South you've got a fairly wide range of conditions between the fire that won't burn and the fire that will escape. Prescribed burning in this area is largely related to weather and moisture. In California and in eastern Oregon, the difference between the extreme where you can't burn at all and where the fire will take off and you can't control it is a narrow range of burning conditions. I've got a couple of escaped fires to my credit that we won't talk about. [laughter] But that's the difference, and you have to be exceptionally precise in the West. There's another angle to it, if you have a longtime operation, you can create fire breaks. Your first half dozen fires may be critical, if you get those out of the way, then you can burn other fires up against them. So if you have a long-range plan and burn critical areas, then you eliminate or you greatly reduce the risk that Bob talks about. I would agree with him.

HKS: I suppose a large part of the problem then was that the weather forecasting was still too primitive, and a front comes through and that's the ball game.

RKA: I was on a prescribed burn with a man who was one of the best fire control experts and used prescribed fire a lot. We were observing a group of ranchers trying to start a burn. They spent up until one or two o'clock in the afternoon lighting fires and trying to get them going, and this fellow turned around to me and said you know, he says, I'll stake my reputation that that fire's not going to burn today. A half hour later that fire chased him and me and his reputation out of there. [laughter] It just took off and exploded. It is difficult. I think the important thing is to have a long-range plan. Not one fire by itself, but a whole series which makes a pattern. The more you burn, the easier they get.

HKS: Was Biswell active in his fire work at Berkeley when you were at the station?

RKA: Yes. He came from the South to Berkeley, and he had not experienced the differences in fire potential. Twice I made myself quite a nuisance to him by saying that no way should he burn. If he had burned a test fire, it would have burned up the town of Santa Rosa. But Harold did a lot of good work, particularly in simplified fuel areas of ponderosa pine with some open grasses or shrubs mixed in.

HKS: What was the primary interest in fire research then?

RKA: Fire behavior.

HKS: Fire behavior.

RKA: Because on every fire you have to predict where's this fire going to be in a hour from now and how hot will it be burning. Then where's it going to be ten hours from now. Can you put men into this canyon or on this ridge? So fire behavior was the most important element in California. In Missoula they concentrated on lightning research, which was most appropriate because lightning started 75 percent of the fires in that northern Rocky Mountain area.

HKS: You were dealing with a lot of arson in California.

RKA: A fair amount, but not as much as in the South. But most of the California fire problem was carelessness by campers and picnickers and people going through.

Station Director

HKS: Have we covered the fire research part of the notes, do you want to go into the station directorship?

RKA: I think we're ready for that.

HKS: Okay, so it's 1957 and you're living in the same house, driving to the same office, and my goodness, now you're director of the station.

RKA: That is an interesting story. George Jemison and I had spent a week traveling California to review fire research. He said he wanted an in-depth picture of it. We got back in Saturday night; we covered all kinds of subjects during that week. Monday morning when I went into the office, there was a note to go in and see the director. I couldn't for the likes of me see why I needed to see him after spending a week with him. He said that he was leaving the station and going to Washington as associate deputy chief. So I congratulated him, and he said McArdle would like to talk to you about being station director here. I thought a minute and I said, gee, maybe I could get there. I said, "Now I've got this and this, maybe I could go in Thursday or Friday." George said that McArdle wants to see you tomorrow morning. So I caught the red-eye special. I think it's kind of interesting; Mac gave me only one piece of advice. (Apparently here again is where Sam Dana had mentioned that I might make a good director sometime.) Mac advised that now you've had experience with probably the best station director that we have in the Forest Service, but you can't be a second George Jemison, you just be Keith Arnold. This is another example of my being in the right place at the right time. Because of a death and then George's move, California had had three experiment station directors in about two years. They could not bring in somebody else from outside and go through major change. George had gotten on top and knew the key people and the key cooperators and all of that sort of thing. There had to be someone local who knew the ropes. I was the only local with a Ph.D. that they could think of at that time. I hadn't been on a forest lookout; I'd only been in the Forest Service a few years and all of that in California. I didn't think that I was qualified for director but the chief's staff did, and so I became the director.

HKS: McArdle came out of research.

RKA: Yes.

HKS: Did you find that good, that he understood research?

RKA: I never had a lot to do with McArdle. I can't tell you when he shifted the reins over to Ed Cliff.

HKS: About '62.

RKA: About '62, and that was about half way through my directorship.

HKS: But he had the RF&D meetings, so officially you got together as a group several times a year.

RKA: Through the years if a chief comes out of research, he pays a little more attention to administration, and if he comes out of administration, he wants to be sure that research knows that he's giving it appropriate attention.

HKS: I suppose.

RKA: John McGuire did not fit that mold, but I think McArdle and Cliff did. It was never serious, that was my impression. McArdle did pay a little bit more attention to the regional foresters and to the National Forest System. Not to any detriment, and Ed Cliff was always responsive to research. John I think hit a balance in between the two.

HKS: Tell me a little bit about Harper, everyone seems to be impressed with the man. He gave a very impressive interview when my predecessor, Woody Maunder, interviewed him maybe fifteen years ago. So you're working for him now, in a sense, or maybe Jemison is who you're really reporting to.

RKA: No, no you report to Harper. You reported to the deputy chief. Les played everything close to his vest. I had contact with him as a director and then in Washington as division director for forest protection research. Les had a keen mind, he was highly politicized; he and Senator Stennis had breakfast every Saturday morning. He used this effectively to keep Stennis up to date, and Stennis is one of the strong supporters of research. You never thought of him as ever having a good time. He was almost always business. We had him on an inspection trip to Hawaii, and he wasn't sure that there should be any research in Hawaii, there were too many distractions.

HKS: Yes. But this was the time of big growth for experiment stations, and new facilities in general.

RKA: Yes, and Les probably was largely responsible for directing and coordinating it--a time when research was certainly growing rapidly.

HKS: You must have had some assignments to deal with the California delegation.

RKA: Yes, although in a normal way--not actually assignment.

HKS: I don't know what facilities there were. You said when you were director you moved off campus so you had to get some money to do that. You must have been involved with talking to the local congressmen about the benefits, right?

RKA: Not at that move, that move was made in-house. We'll talk about that in a minute.

HKS: Alright.

RKA: For example, there was no question that George Jemison would follow Les. George was exceptionally able and he was in the right place. But when I was in there Les was in effect training me as someone who might move into associate deputy chief and on up. Maybe I wasn't perceptive, but it never dawned on me that that was what was going on. He was very strong in the South. I don't know that Les understood the West as much as he did the South. I think the same thing applies to me, I don't think I understood the South as much as I understood the West. You never thought of Les in a social sense of any kind. He was just all business. That's the way that I saw him. To get back to the station directorship, there were two administrative things that bothered me. One was the station name. It was the California Forest and Range Experiment Station. You asked me a while back if fire was so important, why we didn't get more fire money. There were a lot of people nationally antagonistic toward California. It's a big state, it's growing, and you don't want more for California. California at that point was the only station with just one state. E. I. Kotok did quite well and I don't know how he did it except to spend a lot of time with California congressmen. But we received the normal growth that the Forest Service in general got. If it got an increase for forest management and research nationwide, we received our part of that. But it was obvious that the name was a handicap, and we were beginning research in Hawaii. We started thinking about new names. We thought about South Pacific where we'd have our own theme song; that didn't work too well. [laughter] We came out with the Pacific Southwest Forest Range and Experiment Station to make it kind of parallel to the Pacific Northwest Station, and it's had that name ever since. But in addition to recognizing Hawaii, the major reason for the name change was the problem of financing things like the fire lab in southern California.

HKS: Was range a very significant part of the research?

RKA: Yes. We had a fairly strong range management unit; it had two experimental ranges and then did a lot of cooperative work with the national forests. We had an experimental range in northeastern California, Black's mountain, and we had the San Joaquin range in the central Sierra. It was small but it was a very good program. The other administrative matter was more substantive, and I thought more serious. I referred to Duncan Denning as a top scientist and a rather poor administrator. He didn't like administration and was quite honest about it. When I became director there were nine division chiefs. Every area of the forest had its own division in the station. Forest management, genetics, range, watershed, fire, insects, disease, economics, and products. Denning retired at age fifty, and we lost a great scientist. That would prey on my mind every now and then. So I tried to figure out some way to reduce the number of second level administrators. I'd say two thirds of those division chiefs were top scientists, and most of them were not cut out for administration. Largely, they were only interested in their own area--not concerned with the station as a whole. John McGuire had moved out to the station as chief of economics research. John and I together did a lot of thinking on these kinds of things. On an inspection trip we came up with a concept. We decided to change to four assistant directors. One of those would be for application and planning, and each of the others would handle several areas; that is, forest

management and genetics and insects and disease could be together. It took quite a bit of selling. I spent about a year selling the idea to the people in the station. Then it had to be approved by Harper and the chief. As you probably know it's now the organization with some minor changes in all of the stations. Quite a few of the regions and the Washington office have gone the same way. I think it was one of the things that was important to get done at that time. We gained some scientists, and then we had people in research administration looking at the station as a whole, not as one narrow part of it.

HKS: Given the way his career unfolded, when you worked with John McGuire, did you sense that he was going to go far beyond where he was then, or did you think of him mainly as a good economist?

RKA: No, John was a very broad-gauged individual, seemingly very quiet. I enjoyed working with him when he came to Berkeley. He did not stay long, but if he'd stayed he'd have been one of the assistant directors, obviously.

HKS: Okay, they wanted John in economics.

RKA: They wanted him to have some experience. John had worked at the Northeastern Station and had worked for Ed Crafts in planning for a long time, you probably have all that.

HKS: Sure.

RKA: Obviously they wanted John to have administrative experience, which meant he'd be a research director. He needed to have some other experience, so they sent him to California, and we became good friends as well as professional colleagues. Then he went back to Washington and returned when I left for Berkeley. In answer to your question, I didn't know whether he'd be chief or not, but I knew he would be in some leadership role. In fact, I guess at that time I wasn't worried about the chief. Actually, the California station director is probably the best job in forestry in the country. Your boss is two thousand miles away, and in the Forest Service you had delegated a lot of responsibility. It was a challenging job. In that period of 1957 to '63 as director, we developed a full research program for Hawaii. George Jemison had gotten the idea started, had made preliminary contacts, and had sent Bob Nelson over to take a direct look at their research needs. George grumbled about Hawaii. He said here I do all the work and you get to go to Hawaii every three or four months.

HKS: What was the basic rationale for Hawaii? A foot in tropical research? Or just what?

RKA: In the very early 1900s there was a Division of Forestry in Hawaii, and those foresters were botanists. In the early days, Hawaii had a lot of sandalwood. The whaling ships would come in and leave oil and whatever and would take loads of sandalwood to the Orient. They fairly well denuded some of the forests. Hawaii's water is in fresh water lenses, under each island. If those lenses dry up, you've got nothing but saltwater. The mountains are so steep that percolation is not good. For a while, they thought they had lost some of the percolating capacity and might even lose the lens. So the forestry department was designed to reforest about two-thirds of the islands. All of the higher elevation parts were in state forests with fences and gates around them. You couldn't even get into them. The policy was to go worldwide and find species of trees that could not have any commercial value, which they did.

HKS: So this was research aimed literally at Hawaii's problems, and not some broader application.

RKA: Oh no, we're not there yet. This is the program that the state foresters of Hawaii developed in the early 1900s. But then as sugar cane and pineapple moved elsewhere, the islands of Maui, Hawaii, and Kauai all began to have severe economic problems. It looked like maybe they might have to look at timber production as one way to help the economies of the outer islands. This was before the big tourist inroad; they all went to Oahu instead of the outer islands. So there was concern that there needed to be economic development. The research that we were over there to do was to look at commercial possibilities. There were some beautiful eucalypts over there, and there were some recent pine plantations on Kauai. We had watershed research to be sure that we knew what could be done without damaging the water-percolating capacity. Then just plain silvicultural research. Russ LeBarron, who'd

been in the northern Rocky Mountains for a long time and then was forest management chief in California, helped start the work. When he retired, he went over there. It was the kind of research that was done thirty-five or forty years ago in Forest Service in this country, but it was aimed at how can we help the economy of the outer islands. Now the tourist industry has taken care of that economic problem and so now they have broadened the base of research over there to include more fundamental research in tropical forestry, semi-tropical forestry, and that sort of thing.

HKS: I guess it's a wonderful research ground for studying the impact of imported species.

RKA: They're all exotic, right.

HKS: It strikes me a little strange. At budget time, yes Mr. Congressman we really need some money so we can put a research station in Hawaii. I am curious why this was approved.

RKA: Because the Hawaiian delegation put up a very strong front and their economic condition was critical.

HKS: The information gained from that. Can that be generalized and applied to other islands?

RKA: Yes. I've lost touch with it, but I think it's now the Pacific Islands Forestry Research or something like that. We look at applications for Guam and other areas. Another problem was the move of the station from the campus. We were the single largest non-university user of university space, and as that space became tighter on campus, we were asked to move. We had a building through General Services Administration built about two blocks from the campus. A location near the campus was important. We had a lot of our employees working toward a Ph.D. on the side, either on a part time basis or on leave. Then the farther we were away we would lose the direct cooperative contact with School of Forestry and other scientists. We lost that anyway because no longer did we share the same coffee room, which was the most productive place for individual contact. We did strengthen the cooperation with University of California and the California Division of Forestry. That was easy for me to do. George Jemison had started a cooperative study of the wild land research for California which involved the state of California, the forestry school at Cal, and the experiment station. We finished that up in the long-range wild land research plan for California, with priorities for all research going on and for the list of things that needed to be done. That paid off for me. A couple of fellows from a congressional committee came into Berkeley one day and said they were reviewing Forest Service research and could they review us. I of course said yes and they said well now we want a list of all your low priority research projects. I said I don't have any low priority research projects. They didn't like that approach and got fairly antagonistic. There's always high and medium and low. The wild land research plan which had been in effect about a month listed all of our projects with a priority rating which happened to be high. I handed them the report. They walked out of the office and did not return while I was there.

HKS: About this time, I'm not sure if it was the National Academy of Sciences, but a group of that stature surveyed federal research. Forest Service research generally was found wanting by this survey. I was at the station at Portland from '62 to '65, it was during that time. I was wondering if you recall that, was it significant, what was your reaction?

RKA: I don't have any feel for it. I remember that it happened.

HKS: One of my first duties at the station was to go to a big auditorium in Portland. Maybe Phil Briegleb was director then and summarized a report and said gentlemen, we have a serious problem. I'm on the job three days and already there is a crisis in research. You don't really recall any significance, you answered my question.

RKA: There was just one other thing that I did as director. I was always concerned that up until that time a scientist, to get ahead grade-wise had to go into administration. I tried to make certain that as a division chief in fire and then as director that I had a scientist with no administrative duties of equal or higher grade. We kept one or two senior scientists at the station, and that was the finest recruiting for top young

scientists that we had. Here we could point to this man. He's the same grade that I am, and he's a pure scientist.

HKS: Was this too early for the pioneering units, did they exist yet?

RKA: They came in at the same time and...

HKS: Did you have a pioneering unit?

RKA: Yes, we had one.

HKS: What was that in?

RKA: It was in fire physics. We picked up a navy physicist, a researcher, and I can't pull his name out now. That covers what we did. At that time genetics was coming. That was a good time because research was increasing in terms of funding and we had good support in the stations from the Washington office.

HKS: You were the director until 1963. In 1962 Rachel Carson published *Silent Spring*. Certainly the sort of general public interest in what we now call biological diversity and the balance of nature became household words. That must have had an impact on relationships and interests in Congress and certain kinds of research. Did you feel that immediately or was that a longer term thing.

RKA: It was longer term. We got quite an impact on it because the lake one hundred miles north of Berkeley was her observation area. It gave more weight to ecological research certainly, but I can't recall that it caused much immediate change. And I don't think we got any congressional support because of that.

HKS: My recollection at the station in Portland is that it was considered a bug problem, DDT and the spraying. The entomologists were rather upset by the publicity. I'm not sure how many of them read the book or what, but there was...

RKA: Oh, we all read the book. But that's right, I hadn't thought about it but our entomologists were most concerned at the same time. That's true.

Director, Forest Protection Research

HKS: Okay. You finally get to leave Berkeley.

RKA: I figured being a native son, I was ready to stay in Berkeley the rest of my life. I thought it was great. But there was a new position in the Washington office. Les Harper had nine division directors in Washington reporting to him, and that's just too many. Most of them had their eyes focused on their narrow unit and it was pretty hard to use them as a force for either planning or direction in a general sense. So I was asked to come in as a director of forest protection research. I was there for three years. It reduced the number of people reporting to the deputy chief from nine division directors to six. I had fire, insects, and disease; it was called the Division of Forest Protection.

HKS: Does that really make sense from a scientific point of view? Where you have two biological things and a physical thing.

RKA: No, and now it's changed. Forest fire is separate and insect and disease are together. Because of my background I guess that it was all right. I think I ought to mention that in fire, insects, and disease we had three gentlemen who were top scientists in their field. A. A. Brown in fire, Jim Beal in insects, and Ray Hansborough in disease. Now you can bet that they were against this 100 percent. They no longer had direct access to Les Harper, they had to go through me.

HKS: Les created a layer then, where everyone else stayed in place as it were but you were brought in.

RKA: The final judgment on budget came from me rather than their working with Les. But they were gentlemen and they not only lived with it they supported it. There was no backbiting. It was a difficult situation for me; they could have made it impossible. But here again it was a good move and you're right that fire and insect and disease don't go on together. But with my fire background and then the station background, because in the station I think I spent more time on insects and disease than I did on fire, just for the same reason. But I would certainly like to have it on record that those three men, taking in effect a demotion, didn't let it bother them either personally or professionally. They did their job and lived with it.

HKS: I suppose it would have been difficult if Harper had picked one of those three to head it up, because they were...

RKA: No. Those three were more scientists than administrators. I don't mean that in a negative sense, I mean that they were science oriented. They saw the picture as related to their specialty, but not really interested in Forest Service research as a whole. Again it worked out for the best. They had plenty to do, and the growing research in the stations required more of their attention at the scientific level related to the scientists in the stations, and to university relations in their field. I had a very large number of special assignments from Les Harper--to prepare position papers to write or answers to letters that normally he or George would do easily. I thought it was part of the job, I wasn't aware that he was trying to give me experience that might lead to that job of deputy chief sometime in the future.

HKS: Let's pick up the thread again on your time in Washington as director of forest protection research. You said something earlier about the three gentlemen that it turned out you would supervise. Were there many, how can I say this, good scientists in the Washington office, as opposed to people who were scientists that were in management? You characterized them as people who were really better off as scientists. What do scientists do in Washington?

RKA: Scientists in Washington are responsible to evaluate and inspect the scientific programs in their area in experiment stations and the cooperative work with universities. They do a lot of work in evaluating the station's staff, looking for moves that would improve research and bring on future leaders. They write position papers and answer letters that require scientific expertise dealing with their specialty, and it would take a top scientist to do that. They were largely responsible for the international scientific cooperation in the early days, in IUFRO and FAO. If it came to insects and disease they organized and participated in the meetings. Jim Beal and Ray Hansborough were very effective in international forestry in the area of insects and disease as was Carl Ostrom in forest management research.

HKS: Were their colleagues in the other specialties of equal stature as a scientist, and the jobs were all basically the same, analyzing the research?

RKA: Yes, and working with the deputy chief to program priorities in various stations. Carl Ostrom, for example, was a top scientist but also an exceptionally able administrator, as was Herb Storey, and they both became associate deputy chiefs later on. Usually the Washington office division directors were able in the administrative area. But with nine of them you couldn't really develop progress or programs that you might want.

HKS: Okay. During this time period, Ashley Schiff wrote a book called *Fire and Water: Scientific Heresy in the Forest Service* that took on your specialty. What was the reaction within fire research? What was your reaction to this book?

RKA: It was completely naive. I read it, and he obviously had not been on many fires and had undoubtedly reached the conclusions in the book long before he wrote it. I can't recall the details now but I know I read every word in it.

HKS: On the fire side basically it was that the fire protection people were so dominant that the benefits of prescribed burning were supposedly suppressed so not to interfere with the larger mission of putting fires out.

RKA: That was just not so. In the South prescribed burning was pioneered by H. H. Chapman and Forest Service people and carried out. I didn't know of any reluctance to do prescribed burning except in the areas where as I mentioned the available moisture and weather conditions between no burn and conflagration was very narrow. And Schiff did not really recognize that potential.

HKS: The other thing, and you may want to talk about this more when you are at Michigan. McIntire-Stennis. You refer to the cooperative agreements with the universities. Obviously that's very significant, so if you'd comment on how this expands the Forest Service mission, or what did it do really when the universities had access to funding?

RKA: There was careful coordination between M-S and the Forest Service grant program. It allowed university scientists funds for better cooperative research projects. M-S could only be used by state universities in the land grant colleges. The Forest Service largely supported non land grant college research at schools such as Yale. I think at first the Forest Service was a little bit concerned that it might reduce Forest Service research budgets, but I don't think it had that effect.

HKS: We have pretty well covered your time in Washington as director, except that I have to put on the record that that's when I met you. About '64 there was a fire research workshop in Denver, and Dave Bruce, Bill Morris, Owen Cramer, and I came. Everyone went around the room and explained what they were up to, and so we shared information on what was going on at the various stations. You came in and asked if we had all the money in the world, what research would we want to do. Of course I was very junior and everything to me was a learning experience. What impressed me was that more than a few people were really intimidated by your scenario. Is that a technique you've used on other occasions to get people to use their imagination?

RKA: Yes. That came out of the group dynamics that I mentioned in Michigan before. I used it from time to time to try to get priorities in focus. But really you hit it, it's to see who has imagination and who doesn't.

HKS: I remember some of the presentations by people who appeared to be relatively senior. They were very nervous, just stand up in front of a crowd and wish. I'm not sure how they saw themselves, anyway I don't want to dwell on that...

RKA: I'd forgotten all about that.

HKS: It was one of my few experiences in the big leagues. It really made an impression.

Dean of Michigan School of Natural Resources

Alright, it's too good to be true, you were staying with the same kind of job for a while, but now you're going to leave the Forest Service and go to Michigan as dean. How did that transpire? Was there a job announcement and you applied for it?

RKA: No. Steve Spurr had been dean of the School of Natural Resources there, we'll bring him into the picture now. He was moved to Vice President for research and head of the Rackham Foundation at the University of Michigan. The university of Michigan had four departments in Natural Resources at the time: Forestry, Landscape Architecture, Wildlife and Fisheries, and Conservation. They brought in several foresters as a possible dean of natural resources and none of them were acceptable to the other departments other than forestry. Ken Davis was acting dean. Ken wanted the job very much and openly tried to get it. Ken just could not relate well to conservation. He was economic minded and I guess rather bull headed on relationships. I don't mean to be unkind to him, we'll talk about that in a minute. But anyway they'd been at it a year and had not found anyone. Steve Spurr and I were on the SAF Council and were meeting in Oregon. He had to leave the meeting early, because he was going up to see the ice break up on the Yukon River, a typical Spurr trip. I took him into Portland airport. We got to talking, and I said I'm always interested in schools. I said that sometime I want to come back to a school situation. He said well why don't you come out and visit us. I said well, maybe. Two weeks later he had arranged for

me to go out and visit the school. Ken Davis was the first person that I talked to out there. Ken was very strong, he said he wanted the deanship. He came there fourteen years ago with the idea that he would follow Sam Dana. He said Spurr got in the way. He said now I'm going to keep on working for the job but I don't think I'll get it. He said if you're selected as dean, you have my 100 percent support, but meanwhile until that happens I'm working for it. A true gentleman. Anyway, I accepted the job, and it was an interesting one. I was interested in the broader aspects of forestry which it offered.

HKS: Michigan was one of the leading institutions.

RKA: Yes, in forestry education. It was Sam Dana's school. You asked about Sam before and let's talk about him now. It was a school that was always ahead in education. It was formed as a Department of Forestry in 1903. I don't know exactly when Sam came into the picture, but it became a School of Forestry and Conservation in 1927, there broadening the forestry education. Now that was Sam Dana. And in 1950 it became the School of Natural Resources, and Sam Dana brought in and developed the conservation department along with forestry and fisheries and wildlife. Landscape architecture moved over from the architecture school at the request of the department head, Walt Chambers. He was feeling stymied, he couldn't do what he wanted in architecture and he thought he'd have a better chance to go on his own and pay no attention to a dean if he got into the School of Natural Resources. It turned out there were many areas of common interest, as you would know, and they became more important. Besides the original departments, there were new programs in resource economics, urban planning, and resource administration. A recreation curriculum was just being developed. We had four departments, forty faculty, and four hundred students in round numbers--it makes it kind of easy to remember. In my job interview with President Robin Fleming, he pointed out that there was going to be a reduced university budget, because the state of Michigan was in difficulty. He said small independent schools are more apt to be eliminated than just across the board reduction. He said I'll admit to you that the School of Natural Resources is one of them. Per student, it's the most expensive school in the university. He said that the dental school was another possibility that he had in the back of his mind that if push comes to shove we might have to eliminate.

HKS: In the '60s with the environmental movement and so forth there was burgeoning interest on the part of undergraduates in environmental education. That hadn't quite happened yet?

RKA: No, but it was right on the threshold. Some of the best students in the school were in conservation.

HKS: Okay.

RKA: It was starting. But Fleming made the further statement that there's no way that I can close this dental school in the university. Every state legislator has one of our graduates boring on his teeth. [laughter] He said I just want you to know the risk, and I want to support the school and will do it. Well that led to the need for several actions on my part. One was to make the school more important to the university with more cross campus courses, more service courses, more attention to the planning, and more integration within our departments. Forest products as a program had been eliminated several years before. It used to be a major activity, but it had been eliminated. There were still two, full-time, tenured products professors on the forestry payroll who did nothing. They weren't even doing research. They were just occupying their offices. It took two years to have them move elsewhere before we could recapture that money. The new programs were in the right direction for keeping the school. It became my goal to support those more, so priorities went to improve these new programs. We brought in an urban planning group from Michigan State. They helped develop this broadening. But the changes did impact the traditional departments. This is the first time I've publicly ever mentioned this particular problem. In three years the president told me the school was safe, that he didn't have any problems with it. That is one of the reasons I was able to leave to go back to the Forest Service. Let's talk about Sam Dana. I was dean of his school, and he was retired, but he was professor emeritus. He was there every day, he taught some policy seminars. He never attended faculty meetings. He would not come in and sit down in my office. If I had occasion to ask something, he'd stand and walk out. It was unbelievable that he and Steve Spurr both left the job to me. Now if I called Sam and said are you going to have happy hour at your home this afternoon? he always said yes. I could go out there and we'd talk about anything. I could ask

him and he'd give me advice, but never once did he come up with any suggestion or direction in the school unless I asked him for it.

HKS: Both Buckman and Dickerman are fascinated by the history of Forest Service research. Between the two of them they've been collecting odd bits of memos and so forth. And they sent me copies of all the stuff they had collected. One was written by, I think, Earle Clapp about 1935 when he was about to be kicked up to associate chief. He was looking for his replacement, and he was analyzing the candidates. One was Ray Marsh, who would get it. One was Sam Dana. There's three or four others, I don't know who they are now. But the critique of Dana, I wish I'd brought the memo, the language is pretty harsh and I'd like to have you react to it. That Dana was overly ambitious and self-serving. In the '30s he would have been middle-aged I guess, does that ring true at all? I was amazed at that critique.

RKA: That surprises me. He was on my Ph.D. committee. The fact that he stayed at Michigan when he could have been a university president or a high ranking government official in a number of places had he so wanted. If anyone was ever quiet and unassuming, it was Sam.

HKS: It's intriguing that his superior critiqued him that way. In some way he got crossways with Clapp.

RKA: That might have been. You don't know what might have happened in one instance but that was not Sam Dana. I probably have more than one hundred hours with him just one on one talking about forestry, forestry education, and anything that I wanted to talk about. That is amazing. When I did leave Michigan, there was forestry alumni criticism that I used the University of Michigan as a stepping stone to the deputy chief's job. I could not answer them. I wasn't about to talk about the possibility that there might not have been a school. After my initial talk with the president, I had developed a five-year plan for the school. After three years it was on target, some by my efforts and some by just natural development. Lyle Crane in the Department of Conservation had a very broad look at the entire picture of ecological and social systems impinging on forestry, and that led to a lot of things, we'll talk about it as deputy chief later on.

HKS: Do you want to talk about Steve Spurr at this point, is that logical?

RKA: Yes. Steve is probably the most intelligent individual ever related to forestry. He wrote that whole series of textbooks. Wherever he was he was ahead of the game. He knew about the school in Michigan, yet he never talked about it unless I would bring it up. He and I had prepared a paper for the World Forest Congress. I've got some excerpts for later on. I think we were both on the same wavelength. He was an excellent administrator and a top scientist, he had both of those skills. I was never a strong scientist in the narrow sense. I did have most of my interest in the administrative parts of it. Steve was physically oriented. He ran almost every day. Even as vice president of the university he played water polo with the water polo team. He had to be active all of the time. In the middle of a Society of American Forestry council meeting, he would get up and walk over to the corner and do fifty push- ups and get himself awake again. I think his greatest contribution was *Forest Science*. He came up with the idea for *Forest Science* and then was the editor.

HKS: I think I talked to him for two minutes once, but everyone who talked about Steve Spurr was almost in awe, certainly admiration, at the diversity and the talent and the goodness of the man.

RKA: Steve had Parkinson's disease and had a slight stutter when I first met him, even before Michigan. I always thought that his brain was going faster than his mouth. But he'd had Parkinson's for a long time, and it was under control. He had had open heart surgery at the University of Texas. It worked very well, but in treating for the by-pass they lost control of the Parkinson's. The medication that was needed to preserve and make sure that the tissues were not rejected in the open heart surgery caused the loss of the Parkinson's. He lost a lot of control physically, but not mentally. I never knew about Parkinson's until he was giving a paper at Albuquerque at the national SAF meeting. Halfway through he said "And I thank you ladies and gentlemen" and sat down. I was sitting in the front row. He took a couple of pills out of his pocket, he thought he was having a heart attack. It turned out that he wasn't, but when he was in the hospital, the doctor said that he was taking medication for Parkinson's. And from then on he went down physically pretty fast, but he still kept an office at the university. He still typed. He swam half a mile every

day that he could. He walked when he couldn't run. He was a fighter beyond anything that anybody could imagine.

HKS: At a AFA meeting about five, six years ago, he received some award, one of their several awards for outstanding service to American forests. He was at the head table. Everyone was aware of his frailty at that time. It wasn't at all clear if he was going to be able to stand up to make the acceptance speech. There was a very long pause. I heard afterwards that his wife was ready to take the script from him and read it in his behalf. But he got up and he walked three or four steps to the lectern and he read in an absolutely flat, toneless voice, he got through that. It probably was one of the most dramatic moments any of us had ever experienced. The house went crazy with applause for his ability to pull himself together for that few moments that it took to make that speech.

RKA: From then until he died a couple of years ago, I'd been in his home over night many times, and he had a talking board. There's a board about a foot long with one inch squares. He had to touch a square with each syllable to talk. Without the board he couldn't talk. He was just amazing.

HKS: So the school at Michigan is in good shape.

RKA: At least the school at Michigan was secure within the university and it had been given a push in the direction that Sam Dana started it in the 1920s of broadening the base. I think now most of the larger forestry schools have gone that way to natural resources training more broadly or to emphasize specific areas of research and teaching. In the 1920s, '30s, and '40s there were three outstanding forestry schools: Yale, Michigan, and California. Today, we can only look at specialities within a school.

HKS: Let me back track one question. When you left the Forest Service to go to Michigan as dean, was any part of your decision because of being director of forest protection research wasn't very exciting or you looked ahead and you've done about all you're going to do in the Forest Service and that's a chance to try something different or...

RKA: No, no there was no dissatisfaction of any kind with the Forest Service or my work. It was just opportunity offered. I don't think I would have gone to very many forestry schools, but I liked the School of Natural Resources. It was a professional decision that appeared to me to be the one to make at that time. I might say that at that time Ed Cliff talked to me and, for the first time, he said you know, we have you with one or two others who obviously are candidates for Harper's job at some point in the future. That was the first time that I had ever known it. He didn't argue about my going but he tried to give me a little encouragement to keep me in the Forest Service. I've never left any of the positions I had because of being unhappy with either the situation or the promise of the future.

Deputy Chief for Research

HKS: So now you're about to go back to the agency. How did that happen?

RKA: That is an interesting one. The Western Forestry and Conservation Association had a meeting in San Francisco in December of 1968. John McGuire and I were having breakfast, and he pointed out that George Jemison was leaving shortly. They were having difficulty in finding someone professionally qualified for the job in civil service terms. I don't know who it was but there was someone in the Forest Service qualified, and he had passed away. Dick Dickerman was obviously qualified. He had been George Jemison's associate deputy, and Dick had all the qualifications. His wife was ill and he was unable to travel. That job required travel, both national and international. So Dick had removed himself from consideration. John told me at breakfast that Cliff was worried because this might be a way of making the first political appointment in the Forest Service of a nonprofessional nature. John said that I was the only one now eligible. I just made the off-hand comment if that's the case I'll come back.

HKS: What's John's position at this moment? He wasn't chief, Ed Cliff was still chief, right?

RKA: Ed Cliff was chief. John was special assistant to the chief. Again, Christmas Eve. Here is another example of my being at the right place at the right time. Ed Cliff called about 4 o'clock in the afternoon in 1965, December 24th, and he said he'd talked to John and he said I wanted to call you right away. He said you know, since you talked to John, Secretary Freeman has been talking to Secretary of Defense McNamara, they play handball every week. Freeman was saying that they didn't have anyone in-house who could administer the Forest Service's research program. Under the civil service rules there was nobody eligible. McNamara told Freeman, I've got forty or fifty research directors over here, they can direct any research in the country, he said that he would be glad to let Freeman have one. And of course that upset Ed Cliff because that would mean the first nonprofessional appointment in the Forest Service. He said would you consider accepting the job if offered, and I said yes. I said in fact I'm coming into Washington next week. He answered that he needed the application on the 26th of December. So I hurried down to the post office before it closed and got some forms and spent all day Christmas Day filling them out.

HKS: The standard civil service forms?

RKA: The standard civil service forms. About a month later they went through all of the reviews and so forth and so that's how that came about.

HKS: Was it because of the high rank that the civil service was so involved? I was going to ask the question earlier when you were out at Berkeley, it seemed rather casual hiring. I mean the people weren't off the civil service roster apparently, from the way you narrated the story. Did it become more difficult at higher levels, or was Civil Service tightening up the rules as time progressed, or have I missed something here?

RKA: No, there is no short-cutting of the civil service procedure.

HKS: Okay, that was the problem.

RKA: Then when you apply it goes through the normal Civil Service. Even in Berkeley, George couldn't guarantee me the job. He said I'd like you to apply, and he says that based on what I know I don't think there's any question that you would be selected.

HKS: Alright.

RKA: It was a matter that there was no one qualified on the basis of experience and education who could qualify for the position. As a director of forest protection research with university experience, apparently I was eligible. But anyway the official offer came and I moved down there about in May. There's one major difference between universities and the Forest Service as research was carried out. In universities you can have a lot of argument or discussion or various viewpoints on whatever you're going to want to do and then you can have a vote and decide that this will be done, this is the direction we are going. But most tenured professors continue to go whatever direction they want to go. I don't mean this in a derogatory sense, but very few of them are interested in the "school as a whole" or the "university as a whole," they are interested in their area. As tenured professors they don't have to have more than an interest there and some of them can continue to be antagonistic. In the Forest Service, you'd have maybe violent discussions and so forth, but once you decided everybody goes in that direction. It's just a pleasure. I learned that the hard way at Michigan, of the independence of professors. It was repeated again at Texas. It makes the leadership job much more difficult.

HKS: Oh sure.

RKA: Anyway, it was a tremendous joy to return. First with Dickerman as associate deputy. I mean here he was fully qualified and probably better qualified than I. Anytime I'd go on a trip my desk would be empty when I came back. Usually it was full when I left because I'm a dirty desk person as you can see, I usually spread things out. Amy King was secretary. She'd been secretary for Harper and for Jemison. She knew everyone, knew the congress people. She could probably have handled the deputy's job. Most

key positions were well filled as station directors and the division directors. We were in an area of increasing budgets; Les Harper I think probably generated a lot of that, and George carried on. It's always easy to kind of look good if you have funds to improve programs rather than to do it the other way around. It was the continuation of environmental concerns started in Michigan. I think I would have chosen to return to Washington to be in the early environmental movement. I would have put in my vote to come back in order to participate in the beginnings of the environmental and social concerns related to forestry. The National Environmental Policy Act was passed in 1970, I think, and in fact President Nixon had labeled the '70s as the decade of the environment. This had very strong support from Ed Cliff. Ed was just great, just really going out of his way to make me feel not only at home, but to assist in the directions that needed to be changed or whatever decisions were made.

HKS: Let me follow up on that. One of the back benchers in the Washington office, he used to say he sat in the second row at chief and staff meetings, characterized Ed as overly tough. He didn't ask for questions, he came in to meetings, read the agenda, and the only person with courage to challenge Ed would be John McGuire. Do you share any of that view. I mean is this a matter of temperament on the part of Ed that he seemed gruff but wasn't or what was that. Why would that person have said that?

RKA: I don't know. That does surprise me.

HKS: You weren't talking about the same man this other guy was.

RKA: No, I don't know how many times he was in meetings with Ed. I never felt intimidated by Ed. I travelled to international meetings with him as his principal staff man and of course was in his staff meetings.

HKS: Ed may have been rough with National Forest Management.

RKA: But I never felt the least bit intimidated by him. In fact if something came up at the staff meeting that I didn't want to talk about in public, I felt really comfortable with going in and talking with him after the meeting, privately. Maybe because of the way that I came back he treated me specially. I knew Red Nelson very well, who was the deputy chief of national forest administration, and I never sensed that he had problems with Ed. So I don't know where that came from.

HKS: I've asked that question of some other people and they've all responded generally the way you have. Something happened between those two people and it colored that other person's description of Ed.

RKA: I never felt I knew what McArdle was thinking about. Not that he was abrupt, but he appeared remote.

HKS: People generally refer to him as one of the most engaging, friendliest people they ever met.

RKA: Oh he was, and when he'd go out on forests or to research units he would be sure that he knew all the kids' names and wives' names, and it wasn't just put on. He was exceptionally friendly.

What Does the Deputy Do?

HKS: You are answering this in pieces here, but what I'd like to be able to come up with is, "What is it like to be deputy chief?" What does a deputy chief do? I mean, you get up in the morning and brush your teeth and eat breakfast, you drive into work. I know there's no typical day. There's so much going on that you have to delegate a huge amount, what's left for the deputy?

RKA: I was just going to get to that.

HKS: Okay.

RKA: As deputy chief there was a heavy overload, and I soon considered it an issue. Most of it grew during Harper and Jemison's administrations, but it was a sixty million dollar program. Now it's over a hundred million. You're responsible for the work of a thousand scientists in eighty scattered locations. As deputy chief at least the general thought was you would try to visit every location every three years in terms of a review of the work and inspection of the program. Some of that the associate deputy did, but the deputy chief needed to keep in touch. You're a member of the chief's staff, and there's a chief and staff meeting almost every morning. And you're considering all aspects of national forests, broad budget decisions, letters from congressmen. You're acting chief one month of the year, and the chief is in and out all the time. You cover as necessary. I always picked the month of December. I figured out usually if you try to take December off there's always some emergency that came up and they'd call emergency staff meeting or something, so why not just work in December, which I did. There's no small workload attached to being prepared, to analyzing things, to go from a chief and staff meeting to your key people. There was the Nixon White House, and you'd get a phone call, "this is the White House calling," I need an answer to this question in three minutes or seven minutes or something like that. Most of the time you knew what problem had entered the White House. Amy King would immediately get the right person on the telephone if it were something that I didn't know about. When I was deputy chief, there were one hundred and five members in the research staff in Washington, that includes secretaries and key people, and it included a fair group, twenty or twenty-five, in international forestry work. Keeping in the loop of all relevant activities was no small job. The cooperation with McIntire-Stennis took some time in program development. We had joint meetings with McIntire-Stennis leaders regularly to look at the research programs. McIntire-Stennis only applied to land grant colleges, so you still have Yales, Dukes, and other places where there were forestry schools. We tended to direct a little more of our grant money to those institutions if they had the right people. You asked about McIntire-Stennis before. I think it was helpful to have universities with their own funds coming directly, because they had to learn how to get the funds. It took some of the pressure off of us. Details of budget preparation and congressional hearings take time. Then there were requests from Congress, whatever it is. I want a request of what you need or why are you doing this research or whatever. There could be as many as ten of those a day, sometimes there would be a week without any.

HKS: In response to an inquiry from constituents?

RKA: It could be that, sometimes some constituent would ask his congressman why are these people doing this, or I think we need more research here. The congressman would call us and we'd provide appropriate information. That takes time. We had several people who could do it. Besides the associate deputy chief, Carl Ostrom, Herb Storey and others were helpful. International forestry took lots of time. The State Department did not handle international forestry matters. Forest Service Research had the full responsibility. The published papers and national meetings were important. I counted up, in two years I gave thirty-three professional papers scattered around the country. I didn't write all of those, but I'd say probably that I prepared a quarter of them myself. I just wrote the first draft and then had somebody smooth them out. In other cases somebody wrote me a draft and we'd kick it back and forth.

HKS: That's a lot.

RKA: Many of those related to the environment and forestry, the new changes. Maybe I accepted more than I should, I don't know. Then there was other related work. I had the Department of Agriculture assignment for leadership with NASA. NASA had an inter-agency committee, and I represented agriculture and forestry. That resulted in a trip to Russia for the Earth Resources Satellite Program. These programs mapped the waters and mountains, detected insect outbreaks, looked at erosion, etc. This was an antagonistic meeting. The work of that meeting took over one month. I was the agricultural representative of the inter-agency work group on meteorology. We had ties, of course, with the Park Service. We had research going on in Yosemite in California on insects and disease in the parks. So you were asking what does a deputy chief do, that's kind of a listing of the sorts of things.

HKS: Did you have much control over your agenda?

RKA: No.

HKS: Was every day a surprise?

RKA: Every day is a surprise. I think we were working from nine to five-thirty with a half hour off for lunch. I made the habit of getting into the office about seven in the morning, and my prepared agenda lasted for two hours. From then on it was rather haphazard except for scheduled meetings.

HKS: Much social obligation? Meeting with congressmen for luncheons and that sort of thing.

RKA: I didn't do much of that, no. The chief did quite a bit. I think Les Harper did. I did little of that. My social activities related rather heavily to visiting scientists from other countries. Any time that we in the U.S. would visit other countries, people were given a blank check to entertain us. In Russia they just liked to entertain because that got them real alcoholic beverages instead of just plain vodka. In terms of my level at the Forest Service, there were no entertainment funds. So the entertainment in the States came out of my pocket.

HKS: Is that right?

RKA: So I wrote off between a thousand and two thousand dollars a year in entertaining international visitors in research. I'll give you another example. At the World Forestry Congress in Argentina, all the large countries had receptions. Russia, France, Germany, Scandinavia, and so forth. Of course the U.S. has to have a reception. Sometimes at World Forest Congresses the State Department would provide some funding. They didn't in Argentina. Our reception was at the American Embassy and everything was fine, except that we paid for it. We asked each member of the U.S. delegation to contribute twenty-five dollars, and then John McGuire and I gave three or four hundred dollars apiece to cover the balance of the costs.

HKS: Is that typical throughout the government from your observations, that there will be no money for entertainment?

RKA: At the secretary's level there is an obvious need for entertainment funds. The State Department and Defense Department have those kinds of funds. We occasionally would request funds from the State Department if the meeting were at a high level, but for the most part it was on us. We used the Cosmos Club a great deal. I didn't mind. I thoroughly enjoyed that part of the work when we were in foreign countries. We invited many to our home. They would prefer that to a restaurant or club.

HKS: I can understand that.

RKA: We did a lot of entertaining. Another social obligation was to entertain in one form or another station directors when they were in Washington. I mentioned earlier that there was a heavy overload, and so I requested a second associate deputy chief's position. There was really too much for two of us to handle. Herb Storey, director of watershed management, was the first incumbent. Research still has two associate deputies. I think an interesting change is that International Forestry has been moved from a responsibility of the deputy chief for research to the office of a new deputy chief.

Administrative Issues

HKS: Right. Interesting to see how that evolves. How about administrative issues?

Deputy Workload

RKA: The first administrative issue was the overload on the deputy chief for research and the addition of a second deputy. The application of research was always critical. Quite often new research findings, particularly if they affect the National Forest System way of doing things, are a little slow to be applied. That was why we had in each station an assistant director for planning and application. His responsibility

was to work with regions, with industry, and with state and local governments to improve the application of research findings.

HKS: Generally was industry supportive of the Forest Service research program?

RKA: Generally, without fail, yes. Industry was, I'd say, most supportive of Forest Service research.

HKS: They could help you a lot in Congress.

RKA: Yes, and they did. In general terms industry applied specific research findings faster than the national forests. It's something that they wanted and it meant dollars and cents to them, and they really moved. There are many exceptions to that statement. We tried to think of ways to improve that. One was the deputy, or assistant station director for planning and application. Another way was development of research and development units. In other words an R&D unit. We started R&D units in insect research with gypsy moth and southern pine beetle. Units were organized with scientists and administrators operating as a team. Funding was mostly from research, but also from the regions. They quite often were pretty good sized programs, I think the southern pine beetle got up to about a million dollars in one year. There are still some research and development units, but the concept has not gone as far as I thought it might go. Then another issue was the general push to encourage more university research, hold down federal employment, and do things of that sort. The McIntire-Stennis program was run through the Cooperative State Research Service, as you know. The Forest Service gave grants to individual professors for specific research projects where success could be achieved at a lower cost. We had planning sessions with McIntire-Stennis where we reviewed priorities so that we could avoid overlapping and duplication. It's my impression that it worked reasonably well. The McIntire-Stennis program had its own organization with an advisory board and a chairman. They could lobby Congress hard, because they represented universities. I think all in all it might have been more efficiently operated had the Forest Service been responsible. I can understand why the department didn't want the Forest Service involved, and I think I would have made the same decision to put it under the Cooperative State Research Service.

HKS: By and large is university research of acceptable quality?

RKA: Yes, but it is difficult to generalize.

HKS: There's so many graduate students involved, a lot of apprentice scientists working in university research.

RKA: But it's still a responsibility of some professor, and it depends on him. I've heard John Zivnuska several times say the university is the worst place to get research done. He said it semi-facetiously, but semi-truly because teaching should be the primary responsibility. When a prof supervises graduate students, he loses teaching. It's almost like our original division chiefs in the experiment stations. If you have five to eight graduate students, you have a full-time job keeping them occupied. You're not able to do the work yourself. But that's a matter of selection and particularly performance. And if it turns out that some research is not satisfactory, it's easier to change university grants than it is to change Forest Service projects. You have to take time to plan and direct and move people where they're most efficient.

HKS: Were competitive grants in existence at this time, or is that later? Buckman talked about competitive grants.

RKA: That was later.

HKS: Okay.

RKA: We had Public Law 480 grants which were international too and were monitored by our Washington office staff. The Northeastern Station pioneered an idea of a consortium. At the time that I left we had two, we had one in the Rocky Mountain Station and one in the Northeast. The concept was to fund a given research problem or program and organize a consortium with five to ten universities and the Forest

Service. Together they would plan and then parcel out the funding to individuals in universities and the Forest Service to do the research. It worked very well. I understand that the PNW station has four or five consortiums now in various problem areas. That was a new way to get universities involved in forestry research. Those are two issues, the one on application and the one on more work with universities. Another administrative problem comes up periodically. Some regional foresters suggest that stations be administered under regions.

HKS: Yes.

RKA: Regional foresters, if administering research, could set priorities. Usually those priorities would be on immediate problems. The Park Service places its scientists under park superintendents, and the result is no science in research. There was a clear separation of research and forest administration in the early 1900s. The chief of the Forest Service at that time outlined why you need two separate units. The Forest Service has always recognized the value of basic research, and under the regions you're not going to have any. Also you're not going to recruit top scientists. You're going to have lots of administrative studies and you won't keep your best scientists in research organizations. Nor do you get problem analyses that are related to science. You get problem analyses that are related to problems on the regional forester's desk today. The idea of research under National Forest Administration came up now and then. We would go through the arguments that science had to be separate..

HKS: It was 1915 when, under Graves, that research was given official status. Obviously research had been done before that, but that's when the Division of Research was created.

RKA: Your memory is far better than mine.

HKS: I'd like to go on the record that you wrote a marvelous review of my book. It's featured as an article in *American Forests*.

RKA: Is that right?

HKS: Yep. And that was 1976. You were in Texas. You said a blue northern had come through and you were stuck in the house, the book came from *American Forests* so you sat down and read it. So I want to thank you for that nice review. It's out of that work on the book that I know some of these dates. I don't know if this fits under administrative issues, but I'm thinking it does--budget. This is the job for the deputy each year. Do you have any observations you'd like to make about the budget process, or about the hearings in Congress?

Budget Process

RKA: The budget process that we went through each year started with division directors in Washington, D.C. They accumulated needs and wishes from the experiment stations and came up with options, needs, the timing for expansion, and so forth. But also they produced what we called the budget book. The deputy chief was involved in setting priorities and achieving a balance with other Forest Service programs within guidelines set by the secretary of agriculture's office. The final document for research was a book about two inches thick; individual pages with plenty of side margin indicators that described both the stations and the programs within the stations. Those books were the source of information for hearings. When I first went to Washington as deputy chief, I'd spend about two weeks on "the book." I'd actually stay home away from the office memorizing facts and having key people come in for briefing and practice. When I was there we, the Forest Service, tended to put a lot of weight on environment: wildlife management, range management, basic ecology, and so forth. After the budget was reviewed in the secretary of agriculture's office, it went to the Bureau of the Budget and came back to us as the president's budget. Almost invariably the emphasis was changed from environment and broader concerns to production, which is timber and grazing. The Forest Service has taken a lot of flack through the years that it was product oriented rather than environment or resource oriented. There's nothing that it could do about it, because the president's budget was the only public budget document. There always were more changes toward the production end in the secretary and the Bureau of the Budget offices.

HKS: I've read someplace that Congress behaved the same. The Forest Service would usually get the bulk of its request for timber management but only a small fraction for recreation, for example.

RKA: That's right. Let me tell you about Ralph Nader. Have you run into his work on the Forest Service?

HKS: I know generally what he has done.

RKA: He came into Ed Cliff's office one time and said that it was obvious that the Forest Service was in bed with the lumber industry, and he would have a team come in to document that fact. And sure enough, several young lawyers and secretaries showed up. They were given office space and provided any information they wanted. About a year later, Nader in reviewing this work found that the Forest Service was presenting a balanced budget. Nader removed the whole lot and put a new crew in.

HKS: I remember the book now that you're talking about it. He puts out a lot of stuff where he writes the foreword or introduction, but the book is by one of these special crews that he assembles.

RKA: It came out that he was not able to document the emphasis on production.

HKS: The budget process in testimony. Is the chief always there. Officially you're there to help the chief. Do deputies go over by themselves to testify on budget?

RKA: No, but they testify on the part of the budget with which they are concerned. You go over as a team. You have the chief, the deputies, and the associate deputies.

HKS: How about assistant secretary.

RKA: Yes, someone from his office is there. He doesn't testify, at least my experience was that he didn't. The assistant secretary or a staff member was there to be sure that we didn't push a little too hard on certain aspects beyond the president's budget. After one meeting with the appropriations committee, Ed Cliff called me in and said assistant secretary so-and-so thought that you were selling a little too much. I've forgotten now even what it was. I had waxed a little enthusiastic about something. But you have the budget books, and Dick Dickerman always sat right behind me. Anytime a subject or question came up, maybe three-quarters of the time I knew about it. Otherwise, I could turn to the book, and Dick would hand me the appropriate pages out of his book so that I could respond. You can say "I don't have the answer to that question but I'll provide it for the record." We tried to keep it at a minimum. In fact, almost uniformly, the Forest Service was complimented that its people seemed to know their subject much better than the staff from other agencies.

HKS: Did you ever rehearse before you went over? If he says this, who's going to say what, or did you know your roles well enough that you just responded to the situation?

RKA: The chief would normally respond to that subject, and he would often ask one of us to respond. We did not need to rehearse. The chief presented the overall budget, and then State and Private Forestry, the National Forest System, and Research deputies would present more detail about their budgets. Even then the chief might join in.

HKS: Were there times when you testified to Congress other than budget?

RKA: Yes, you testify on bills. They were trying to limit clearcutting once, and that was...

HKS: Monongahela was during your time.

RKA: Yes, one time when I was acting chief, Julia Butler Hanson called. She had a new congressman who wanted to eliminate from the budget anything that would allow clearcutting. Three of us went over and presented the Forest Service view about the problem. She said "we're going to lunch now," she says

you come up with language for the budget bill. She was quite direct as you know. As she walked out, she turned and said, "Get some language that I can sell to that son of a bitch, would you please." [laughter]

HKS: Her papers are at the University of Washington and I had the opportunity to go through parts of them, trying to watch for Forest Service appropriations issues. It was interesting to watch Congress in action.

RKA: She knew her subject and made sure that everyone testifying was honest.

HKS: When she was on our Board of Directors I once wrote her a letter asking her if she would give us some advice on how we might gain some government contracts or some support somehow. I can't remember how I phrased it, but she wrote back and said her primary job was to reduce federal expenditures and she would not give us advice on how to get funding.

RKA: When I was with a NASA team in Russia, I flew back the Saturday night before Monday budget hearings, and I didn't get my two weeks preparation. I remember Bob Buckman came over on Sunday and briefed me all day, but I was still on jet lag. We went to hearings Monday, and after the hearings were over she said Dr. Arnold would you stay for just a minute? I said, of course. When the others filed out she said, what's the matter? You didn't seem to be on top of your subject today. [laughter] I said I guess it's because yesterday morning I was in Russia. In my book she was fair, she was hard, she understood, she knew her subject area. I didn't have a lot of experience over a lot of number of years.

Shifts at the Top

HKS: You worked with two chiefs, both Ed and John. Would you like to characterize in some way when one chief leaves and another comes in? Is there any change in the operation really? A different name on the door, but does the Forest Service have enough momentum?

RKA: I think that's right, it has enough momentum and there's enough stability that things don't change overnight. I think more it's a matter of management style than anything else. The Forest Service at that time had exceptionally able people. One thing that the Forest Service has done is maintain that a professional be in the chief's position. Now in the Bureau of Land Management and the Park Service that is not the case, and I've heard from Boyd Rasmussen who was over there for a while that there when a new head comes in you may have a major shift, and quite often do. Because he may or may not have any background in your area, he may be some congressman who didn't get elected.

HKS: The Park Service under Nixon, I can't remember who that person was, but he was from North American Van Lines or Pepsi-Cola or something. He certainly wasn't out of the Park Service.

RKA: There's one answer to your question. The chief is a professional, he's been in the right chairs. He can come from Research, State and Private, or National Forests. I'm not aware of any political activity within the Forest Service that had factions trying to put a certain person in as chief. I know of some individuals who wanted to be chief, and they made it known. The chief has been a professional, been appointed in a professional manner, and acted as such. It would be very difficult for some major change to take place.

Agricultural Research Service

HKS: I don't know if this is an administrative issue or not. ARS, were you liaison officially to the department for matters of research?

RKA: Yes, we didn't have a lot to do with ARS. There was conflict earlier on when range management was moved to ARS. We rarely had any difficulties with ARS at the time that I was there. But there was a time, I think it was while Harper was deputy chief, that they were trying to take over more of the research in the Forest Service.

HKS: During the other kinds of reorganization, where the Forest Service and the BLM and so forth might be merged, research was one of the issues. What would happen to Forest Service research. I think it was McGuire who was explaining that under the Nixon plan, which you may have been involved with, that State and Private Forestry would go to HUD or something and research would go to the... I mean really split it up. So you'd wind up with forestry not together, again, even after the reorganization. But that kind of reorganization wasn't something that you were concerned about when you were deputy.

RKA: No. President Carter tried the same thing while I was at Texas. Steve Spurr and I were consultants informally to the White House and to the secretary of the interior. They wanted us to be in support of moving the Forest Service to the Department of the Interior. We emphasized that the Forest Service had to be an integrated, self-contained unit. What happened was that Carter got involved himself, and he kind of eliminated any possibility of anything happening after task forces had been doing a lot of work. I don't have my records on that. He finally did not try to move the Forest Service to Interior. Interior made another push to have the Park Service handle all recreation on all federal lands. That again got bogged down in the White House.

Forest Products Laboratory

HKS: One more subject, and again you may not see this as administrative issue. The Forest Products Lab. The way it's presented in the chief's reports and other Forest Service reports, it's always AND the Forest Products Lab. It's like everything else AND the lab. Is that an accurate characterization? It's not a team player, and somehow it's so different that it doesn't fit in with the rest of the team, is that...

RKA: Yes.

HKS: Was that an issue or a problem for the deputy?

RKA: Yes. It was both an issue and a problem and it still may be. The Forest Products Lab was an efficient and effective research and development unit. They were ingrown. They didn't want anyone from the outside to come in and they didn't particularly like the system of the research problem analyses that went on. They were most productive but they did it their way. Finally we got key lab people to come into Washington in the Products Division director's job. That helped a lot. The Forest Products Lab wouldn't build on research done at the Southern Forest Products Lab or at universities. They had to do it themselves and use their own data. We ran into that in the Armed Forces Special Weapons project. We had worked through maybe four atom bomb drops and had certain basic information that would be of assistance to them. They started right over in working with effects on structures. That sounds like criticism but it was just their way of working. You described it very well, it was a different unit. It was under research, but again it kind of went its own way.

HKS: Does it make sense for the government to do forest products research? Does the government do oil research? Is this unique, this particular subject? Is it an accident of history, or is there real logic in terms of a complete research program that there be a Forest Products Lab?

RKA: There's real logic there. First thing is that forest products can describe the kind of tree that should be grown, length of cells or vessels or specific gravity or all of that sort of thing. The Forest Products Lab through work in computerized sawing can make a given log more efficient. If you get more lumber from a given log you reduce the impact on the forest, less timber to be cut. No, I think it was most appropriate that it was not outside of the realm of the support of the Forest Service. ARS does all kinds of poultry research and research on almost every crop in the United States, genetic and otherwise. And I can't...

HKS: So, if there wasn't a Lab, the experiment stations would almost have to invent a replacement of some kind in order to know how to round out the research?

RKA: That is correct. In Berkeley we only had two people in products. They applied Lab results to local conditions. It's something that has to be done because it impacts the kinds of demands that are put on the forests for cellulose.

HKS: The forest industry is certainly engaged in products development.

RKA: Yes.

HKS: This to me would be the only rationale I could think of to question the existence of the Lab, because you have the number six industry in the U.S., in terms of sales, engaged in products development. Why does the government have to do it too, why can't the industry do it? I'm not advocating this, I'm just asking a question.

RKA: The Lab does do basic research. The Lab, I'm trying to think of the right words here, the Lab has to take research up to the development phase, but the application and development of it should be industry. Up to World War II there were many small units in forest industry. Application and development were probably appropriate. Today with most industrial units very large, they should and can do their own development.

HKS: In your experience was there ever a time that industry was nervous that the Lab might develop something and patent it for the benefit of the public that somehow cut into the special interests of the company that was about to corner the market on a process and patent it.

RKA: I did not run into it.

HKS: I'm not trying to make devils out of this, I was just asking a question.

RKA: We were finally able to make the Lab more an integrated part of research. We attracted some of the younger people in the Lab out to positions in the stations or the Washington office. In fact, one of those that we attracted out is the director of the Pacific Northwest Experiment Station. We were able to integrate the Lab more and more into the Forest Service. Dickerman and I, when I was there worked on that, and he continued. Les Harper had given up on Lab integration.

E. I. Kotok

HKS: It just took too much time to do that. That's all I have on administration. You said you'd like to talk a little bit about Ed Kotok.

RKA: Yes, I hadn't brought him in except when he invited me to leave the Forest Service early on. When George Jemison came to the California Station as director, Ed Kotok had retired and was living in the Bay area. Ed decided that he could help George run the station. He got to spending an hour or two or three hours a week with George. Finally, out of desperation, George asked me to find a job in fire that Ed could do. We developed a study outline of fire control and fire research that Ed could work on, and it was appropriate because he had run the very early fire study in California back in, I guess 1925 or '30 with Show. His health broke down several months after that, so it was never completed.

HKS: The early work on fire, was that the controlled burning?

RKA: No, that was fire control in California. It actually led to more rapid initial attack. They studied the fire damage and size of fires in relation to the nature and timing of the initial attack. It was used as a basis for spiking up fire control and fire control forces in the West and probably all over the country. I thought of one other area for discussion. I did mention briefly the difference between the Forest Service as an organization and universities as organizations. I think I had a view of the Forest Service probably different than anyone else. I came into the Forest Service in a middle management position, as division chief of fire. Most key Forest Service people had paid all their dues and moved through appropriate chairs. I had not. Then after going to the Washington office, which I never thought that I would ever do, I moved out to Michigan and then came back again.

Charles Connaughton

There was only once in that entire period that anyone in the Service referred to me as a late comer or someone from the outside. He was one station director that I didn't get along with too well. We just didn't work on the same wavelength. Other than that, I had I think a chance to view the Forest Service as an outstanding organization. It was highly professional. It was a team playing outfit from start to finish. I'd mentioned that once you decided on a direction or made a decision, everybody pitched in. It was more than that. I know that many Forest Service people were asked to move or to take particular jobs that personally were not attractive to them, and it was rare that they ever refused to move. One exception was Charlie Connaughton, an example of someone who had said early on he would never go to the Washington office, and he never did. Yet I'm sure had Charlie followed a path of normal moving from the field to the Washington office that at some point at time he would have been the chief. I don't think there's any question about that. He was strong enough and had all of the abilities. But Charlie was a field man, and by the calendar he kept very close tabs. He spent 50 percent of his working time in the field, out on the forest, and 50 percent in the regional office.

HKS: Wow.

RKA: I've seen Charlie in December when he looked at his calendar and found he was seven or eight days short in the field. He took off for the forest at that point.

HKS: That must have been almost a record among regional foresters.

RKA: I don't know how other regional foresters were, but he insisted that he was a dirt forester from the very beginning and he was proud of it. He was going to remain that way no matter what. He also had been a station director early on, but he never tried to run research from his regional office.

HKS: Bill Towell talked so highly of Charlie, who was very active in AFA, about his broad vision. The anecdote was dealing primarily with the '70s when so much forestry legislation was enacted. But Charlie saw that was what was missing in the '60s, there was no organic plan for the Forest Service in terms of what Congress had said, lots of bits and pieces and traditions.

RKA: There were many forest supervisors who thought that they had the best job in the world and would never leave it to be promoted to a regional office or on to the Washington office. They made excellent forest supervisors, but they didn't have the opportunity to contribute at higher levels. The Forest Service, as far as I could see, was unique in the area of government organizations.

HKS: I think everyone acknowledges that, whether they're advocates or adversaries of the agency.

RKA: Yes.

HKS: In my interview with Max Peterson, of course he worked for Charlie for a long time, most of his anecdotes were how hard-nosed Charlie was, or at least everyone was kind of afraid of Charlie. Your dealings would have been much different.

RKA: No, I have only respect for him, and I went to Charlie for advice at times. He came to me for advice. Charlie had some problems when he was president of the Society of American Foresters. He spent a lot of time as any president of SAF did on SAF affairs. Some of his forest supervisors got upset and were about to complain to the chief that they had a regional forester who wasn't available to them. I was able to meet with three or four of the key people who were most unhappy and get them to see the big picture. And he certainly had a mind and a capacity to look at the very broad picture.

HKS: When I interviewed Max, he didn't say it this way, but obviously it showed his broader interest. He was an engineer but he poked around to find the background of issues and he talked about being involved with the research people, because he wanted to know more about how things happened. And you had mentioned briefly earlier that you had wanted to hire Max in research. Can you elaborate on that?

RKA: Well, not much. I was director and even as division chief in fire research, Max obviously had amazing talent. We needed engineers in research. I had several positions that I talked with Max about from time to time. He just wasn't interested in being in research. He was supportive of research and was involved in cooperative studies which required engineering work out of the region. But other than that, there was no direct tie to Max.

Minority Hiring

HKS: It may not have been significant during your tenure as deputy chief--minority hiring, which is such a major issue today, diversity in the work force and all of that.

RKA: It was not a strong effort. No I shouldn't say that, it was there and we were looking. We had difficulty finding scientists, and the one thing we did do was to work with Tuskegee Institute. We put a research scientist down there, Brian Payne.

HKS: I know Brian.

RKA: He lived there and helped develop a pre-forestry program that would feed black people interested in forestry to the Yales and Michigans and Dukes and other forestry schools. It had some success and is still operating. But yes, I'd forgotten about that until you mentioned it. Chief and staff asked research to handle the project. We had several minorities in the Washington office staff, but it was difficult to have, at that point in time, blacks in the field. I remember one black in forest insect research in Missoula in the 1960s. He was working at the northern Rocky Mountain. Many restaurants would not allow him to eat with other scientists.

HKS: In the Rocky Mountain region.

RKA: In the Rocky Mountain region.

HKS: I didn't realize that.

RKA: So we moved him to California where he had more freedom, and later on he was in the Washington office.

Research Issues

HKS: Okay. Those are all of the issues that we have under administration, so let's turn to research itself. What were the issues? This was the late '60s and early '70s, we had NEPA, we had Earth Day, a lot was going on we can see in retrospect. It's not always that clear at the time. What was the impact on research?

Environmental Decade

RKA: Environment is the principle issue that I can see from this vantage point. I didn't realize how much I'd been sensitized to the environment and to the changing roles of foresters while at Michigan with Lyle Crane in the Conservation Department. There's no question that Nixon hailed in the '70s the environmental decade as he opened it up with the National Environmental Policy Act, NEPA. But as I saw it, we had the ecological, physical, social, and political environment all beginning to intertwine. My goal, I really didn't state it as such, really was to move forestry research to the cutting edge of environmental policy. To emphasize the need for recreation research, to emphasize the need for basic studies of ecosystems and particularly in recruiting young scientists with broad interests. To use research as kind of the leader to help move the Forest Service into this environmental problem area. I went back, just because of this review, through all my publications. Up to 1968 they all dealt with forest fire or research needs. But then from 1970 to '72, of thirty-three formal papers, eighteen dealt with conservation, environment, and the changing role of foresters. I was amazed; well over half of them. I want to feed into

our conversation some of those papers because I think they describe where we are today. I had no way of feeling that the forestry movement in this environmental era and the political impacts would be anywhere close to where it is now. But in a first presentation to the RF&D meeting after I became the deputy chief, I stressed the increasing concern about the environment and how it impacted forests.

Wilderness

We had to look very carefully at the whole balance of nature. Our population, culture, and technology were having a much greater impact on forestry and forests than it ever had before. The interesting thing at that time, and even today, the Forest Service is still wearing a black hat and is not getting credit for what it really has done. You know that the Forest Service started the wilderness movement and had many millions of acres set aside even before the Wilderness Act.

HKS: Sure.

RKA: Yet the Forest Service is kind of seen as anti-wilderness. Research was studying then thirty of the thirty-three recognized ecosystems in the United States, and we were encouraging greater detailed studies. The Forest Service was the largest single employer of landscape architects, even at that time.

HKS: Those numbers always amaze me. Diversity of work force, I mean there's a different kind of diversity.

RKA: Of course we were the largest single employer of ecologists, pure ecologists, along with everything else. I suggested that the Forest Service needed an environmental analysis group comparable to forest economics. Steve Spurr and I, earlier on, actually in 1971, prepared a paper and presented it on "The Forester's Role in Social and Economic Changes" at a world conference on forestry and forest education. The highlights of that paper could probably be written today. Steve and I were not looking that far ahead, but we talked about forests offering a tree-based environment for production, psychic well being and social well being. I hope you don't ask me what psychic well being is.

HKS: Intuitively I know what it means.

RKA: Foresters were looking to develop more simple ecosystems. Foresters needed to produce more critical and complex forest ecosystems, and cities need to be surrounded by forests and have forests threaded through them. Foresters have to learn to manage for environmental beauty. I think it's very interesting that Steve Spurr, in about 1960, gave a paper at the National Wilderness Conference in San Francisco. Steve at that time pointed out, (why he wasn't ostracized I don't know) that we have to manage wilderness ecosystems the same as any other ecosystem. Now he did indicate that there were some scientific needs to keep some part of wilderness completely inviolate, maybe not even allow anyone in. He said that wilderness lovers enjoy the wilderness as it is today and that foresters know enough to keep them just as they are. But it requires active management in insect and disease control, fire control, fire use, even some cutting to keep the appearance as it is today. Now that, of course, has never happened. Charlie Connaughton was at that meeting, and he gave the closing comments. There were several hundred people there. He said all of you will go home and you've had a good say on wilderness and we've dissected the problem and he said and you'll play golf or read the Sunday paper. But we in the Forest Service will make sure no water is polluted. He said somebody this week will get hurt in the wilderness and we'll run a rescue to get them out. He said wilderness is on my mind almost every waking moment along with other forest problems. It was an interesting comment.

Natural Areas

HKS: How about natural areas in wilderness. Was this an issue or are natural areas set aside in some administrative fashion to not be manipulated, to have those within the wilderness area.

RKA: They were called research natural areas and they could be anywhere. Some were in wilderness areas, also there were plenty of research natural areas outside of wilderness. I guess when I was deputy

chief we added some fifty or sixty research natural areas. We wanted research natural areas in every major ecosystem. They were selected with the help of regional offices to be sure that we didn't locate them where a road might have to go ten or twenty years hence. But natural areas were not related to the wilderness concept. The concept was related to the opportunity to study ecosystems undisturbed in contrast to the managed ecosystems around them. They weren't large areas. They didn't compare in area to wilderness areas.

HKS: All right.

RKA: Then Steve and I in that paper made this statement: "Foresters will be working in the strong glare of conflicting public opinion and often in conflict with the inputs from other professionals." That certainly predicted what's happening today. But it was clear enough that you could see what was coming. I never would have imagined that we would have had the impact of lawsuits and other purely delaying tactics that go on today. We said that foresters will have to reverse the trend from more efficient man-simplified systems to more complex systems. That foresters are going to have to be responsible to people and involve people in their management decisions. And we have to obviously have a holistic approach in all forest practices. I'm bringing these up because you mentioned before the major issue of emerging environmentalists. I always thought of myself as an environmentalist, and I think most foresters do. We have our basis in ecology. In a paper for an FAO meeting in Rome, I talked about the complexity of the forest environment. Globally, forests produce over one half of all photosynthesis and all transpiration, actually the air conditioning effect on the world. Regionally our forests regulate floods, they reduce soil erosion. They could even be used for sludge disposal and sewage waste disposal as well as being a basis for the wood and paper products. Then you get down to the microclimate of forests where they ameliorate weather. They have places for kids to climb trees and so forth. We could go into a lot of detail but this was apparently what I arrived as deputy chief with. I was not then aware of how much emphasis I was giving environment. But all of those attributes of forests affect people and often provide antagonistic choices. I think probably the big problem awaiting resolution is that the people of the United States have not decided what they want to do with forests. We have factions, and I guess we're going to keep on having factions.

HKS: It looks that way.

RKA: Obviously we used all of these things I've been talking about in determining program priorities. We tried for a lot more emphasis on wildlife, soils, air, and recreation research as well as basic research in the ecosystems. I think we mentioned before that even though we gave initial priority to those things for increases in budget preparation, increases were made in timber and wood production related activities. One comment is important. The Washington office, and particularly Ed Cliff, changed rapidly, but the field part of the Forest Service was slow to move.

HKS: Let's follow up on that. When I worked in an experiment station, we would hear complaints from the field that research never did anything that they could use. It was too technical. The field forester didn't know how to apply this stuff. It seemed to me that it wasn't a real argument. Those people were adequately trained, they could in fact read this stuff but apparently the rewards weren't there, there wasn't an incentive. What was your gut feeling of why the field was slow to respond to changes in technology?

RKA: Part of it was, and I've given it quite a bit of thought, that they had a job to do. Most of them were overworked, they had very heavy loads in the field with things that had to be done. Those loads were always being disturbed by major fires that might take a man away from his job for several weeks at a time, so that they really didn't have the time to look for ways of applying new information. We had in California, two or three instances that I recall. We asked the regional office for comments on a major paper. Every now and then a comment would come back from somebody in middle management that well we really can't publish this because this indicates that our current policy, whatever it is, is not good or should be changed. All I had to do was mention it to Charlie Connaughton, and we would go ahead and publish based on the research results. I've been trying to think why the field was so slow in looking at the environmental movement. We had those people that were excellent field foresters doing their job, but they didn't have time to sit back and look at the entire picture. They had so much timber to mark. They

had trails to build. They had people to manage. They had all kinds of emergencies: lost people, fire, insect and disease attacks, these kinds of things. They really couldn't back off and say what went wrong. A lot of the clearcutting problem came the same way. If you've got so much timber that you're supposed to get out, and you don't have the time to mark all the timber, it's pretty easy to put a line around it and clearcut the area. In the next year you clearcut some area next to it. All of a sudden you have a very large area that's clearcut. I think the only time I ever saw Ed Cliff completely nonplussed was right after the Monongahela. He made a quick trip to the field. And he came into the staff meeting on Monday morning still just shaking his head, "I can't believe it." He said clearcutting is good but we can't just clearcut those tremendous areas.

HKS: So he went on the Monongahela to look at that?

RKA: Oh, you bet. And then also he looked at some of the areas in the northern Rocky Mountains.

HKS: Max was telling me that he and Ed toured some Region 1 clearcuts just before Monongahela, or at that time. They both were appalled at what they saw, and by the rationale and the justification from the local people. That's sort of an amazing comment to me, that in this reward system the guy on the ground is getting rewarded for being the cutout type, he's not being rewarded for changing with the times.

RKA: Yes.

HKS: Research isn't the issue, it's somehow in the layers of bureaucracy. The reward system is not responsive to change.

RKA: Starting back in 1891, we never had a period of such rapid change. It all hit in a very short period of time. Foresters, those who had been out for ten or fifteen years, had been taught production forestry. It's just the sheer pressure of doing the daily job, in the national forests. We just didn't have any dead wood scattered around. The field people in the field season were completely overwhelmed. Working fifty, sixty, seventy hours a week, even more. And you don't build into a regular work schedule large fire control needs where you may be out for several weeks.

HKS: This is your interview, but I've two anecdotes that maybe you can react to. When I was on a ranger district cruising timber I ran across some silver fir and the needles were chewed off pretty bad. I snapped off a branch and sent it in to the entomologist at the experiment station in Portland and asked him to identify it. The answer came back through channels, with a really angry note from the supervisor's office, that they have the answer to all the questions and it was absolutely inappropriate for me to go to the scientists. Well that's a problem. I could have gone up through channels but I didn't even realize there was a channel to go through. Does this surprise you?

RKA: No, many field foresters didn't like to have any feeling that they didn't know what was going on on their forest. There are plenty of exceptions to that. Many used research at every opportunity.

HKS: The bug, by the way, was not a serious problem. The other one was in reverse. When I was at the experiment station examining a series of field plots throughout the Cascades, measuring the effect of slash burning on the vegetation that would come in afterward, the first step in the process was to go on the ranger district, introduce myself to the ranger, explain that we had the plots there and I'd be working on this district for a day or two and just say howdy, maybe get a map of the district. I visited about twenty districts during that summer. Only one ranger said sit down, what are you working on, I want to hear more about this. Most were fine thanks, good luck, but several were really hostile. One wouldn't allow me to stay in the crew house, because that was for Forest Service employees. Does that surprise you that research is not viewed with great romance by some of the people in the field?

RKA: No, I would wager that he was probably fifty years old and was still at the ranger level.

HKS: Could be, I don't recall.

RKA: We had forest areas in California where we just didn't bother to go because it was too much effort to get work done. We had other areas where everything on the forest would just stop to help in any way. For the most part, Research and National Forest Administration worked well together.

HKS: I don't want to interrupt your thought train here but I've got two other general questions about the environmental movement, as it were. You hire a scientist, really competent, has a certain expertise, field technique and whatever. And the world changes. Now we're going to study more environmental things. Given the long term nature that research tends to have, how do you have a course correction when you're dealing with people, not with changing the subject, but how do you get people to change. I mean they've just written a famous paper, everyone is congratulating them and suddenly you say well don't do that anymore, we've got something of a different nature we're working on.

RKA: I couldn't say that to him, and would not. But we would ask him in the light of current problem areas that he review, revise, or develop a completely new problem analysis. You can't tell an able scientist what to do. But in the problem area to which he's assigned you can ask him for a problem analysis. That was the way that you made changes with an existing staff. Maybe the problem analysis would show that they didn't have the right mix of people in that, so slowly you could look for a place where this individual would fit and then bring somebody else in that would do the job. Those are the approaches that you had to, had kind of a problem. Creation of new research teams and recruiting new scientists would create change.

HKS: Relating research to the so-called real world, in Washington, the political world, did you or your staff work directly with the White House or the science advisor to the president when NEPA was on the drawing boards, Earth Day was around? Did the White House call the Forest Service and SCS and others and say hey, what's this all about and get feedback? Does research get involved in policy itself or is that somebody else?

RKA: Rarely did research get involved in policy except in economic studies. The chief or Ag. forestry staff would use the material. The examples you mention were pretty well cut and dried before I was in the Washington office. But no, there was no call from the White House to research. It would go through the department, then the department would ask the Forest Service either to provide two or three people to work on the task force or just prepare draft material.

HKS: So you were just another member of the public in terms of what the president might have in his State of the Union address on an issue. You weren't involved in that sort of political aspect of forestry.

RKA: When he was making a State of the Union address, I would ask all research division directors to make statements that they thought important in their area. In chief and staff each deputy would have three or four items for possible use in the State of the Union address. Chief and staff would make up a list of four or five items that they thought were important to mankind and the country and send them to the secretary. Occasionally we would get one or two sentences in the speech.

HKS: I just heard an anecdote, and probably there's some truth to it, but it's so fun to burlesque it, about President Bush's activities at the Rio earth summit. Two days before he went down he announced one hundred fifty million dollars for international forestry. The next day in International Forestry, so I've been told, they got a call from the White House saying how are you guys going to use this money? [laughter] There were some follow up questions I guess from the press and they didn't have the answers, so they wanted some answers to tell the press. I'm sure there's some cynicism in that anecdote, but one could see that happening.

RKA: I could believe it, sure.

HKS: Okay, I stopped you midcourse.

RKA: No, you didn't, because we came through the major issue, which obviously was the environment. I thought that I might be almost out of order by pushing on the environment. Yet Ed Cliff and his staff, working as a whole, encouraged me to do all that I could. I wasn't out of line nor did anybody say slow

down. I can't take any credit for any changes or improvements, because the policies were clearly stated and changes were made out of the Washington office. It was maybe ten or fifteen years later before there were major impacts in the field.

HKS: Ed took a lot of heat, even abuse, for a few sentences in a statement he made at an RF&D meeting, probably his last one as chief, saying that the Forest Service was not prepared for the environmental decade of the '60s. There were those that likened that to Eisenhower warning of an industrial military complex; like alright, chief, if it wasn't ready, then maybe you ought to speak out as to why it wasn't ready. You've spoken about Ed in kindly ways, and I'm not asking you to be unkindly, but were those shots at Ed at all fair or was everyone overwhelmed and surprised by what happened? At the rate of change of attitude toward the environment? Maybe the Forest Service was better prepared than any other agency.

RKA: I think that was what I tried to point out, that the Forest Service did not get credit for a lot of things that it had done. Ed Cliff was not at fault in my view. The population of Forest Service employees in the field were not ready. And they weren't ready five years or ten years later. The Forest Service policy of delegation down to the ranger district made such major concept changes slow to implement.

HKS: I went to forestry school in the '50s. When *Silent Spring* came out, I said yeah that's right, that's what I learned in forestry school, that biological control is better than other kinds of control. I don't know how typical I am, I don't know how typical my education was, but most of the environmentalists' criticisms of forestry are compatible with what we learned was the best theoretical practice in the '50s in school. You can't always afford to do it, maybe we don't know how to do it yet. I'm trying to follow up on your statement that the foresters weren't ready in the field for the change. And yet if they went to school in the late '50s, early '60s to the extent that I'm typical, they should have been better prepared.

RKA: How many people were in field positions that had any real say on what was done? In the '50s and '60s those people were educated in the late '30s or '40s. I think you were right at the change point. I would hazard a guess that in the '50s about one-half of foresters were prepared to listen.

HKS: So the people in the field, the ones out driving the pick-up trucks around, they actually were ready, but middle management was another generation of education and priorities.

RKA: Your statement might apply to the '70s and '80s, but not the earlier times. The now retired supervisor of the Ouachita National Forest as late as five years ago saw the Ouachita Forest as the best timber producing forest in the South. I'm maybe doing him an injustice, but he treated the forest as a supervisor in the '50s would treat the Ouachita Forest. Again, the Forest Service in the East gets no credit for taking abused farm lands and severely eroded watersheds and converting them to beautiful productive forests. Today, the Ouachita is one of the greatest forests in the country, both in beauty and recreation as well as timber. The Forest Service has changed millions of acres of land into productive forests. One very important point. For the most part, timber sales are the only way to treat forests. They are largely the only source of funds.

HKS: I read a comment by some Forest Service guy, I think he's in the Washington office. He was talking about the eastern forests, essentially all of which were acquired as cutover and abandoned lands, pretty much abused in the environmental sense, and now they're back looking like the forests we have around here in Arkansas. The Forest Service sees it as an enormous accomplishment. And the environmentalists see the Forest Service as the one that's causing all the environmental damage. It's a conflict of cultures. I guess there is no way of actually bringing these groups together.

RKA: Old growth forests uncut are generally not the places that you stay in for recreation. Almost all campgrounds are in areas that have been cut and managed for years. A typical western old growth forest, as you well know, is kind of dark and damp and really it's interesting to look at, but it isn't a place where you actually stay for some time.

Research Progress

HKS: Let's get to something more specific about research. On the outline you have examples of research progress.

RKA: We had to react to emergencies when the clearcutting and the Monongahela issues appeared. There were many task forces formed to study the situation and to determine how critical it was and what could be done. They always had one or more research foresters or research scientists with regional or with national forest people. Carl Ostrom prepared that excellent publication, *Methods of Cutting Appropriate for Forty-Five Ecosystems in the Country*. It was not the subject of new research, it was just a compilation of what had gone on before. But in looking at those issues, I think all we could do would be to mention some of the kinds of things that research was accomplishing at that time. The Forest Products Laboratory, we mentioned before, was into low-cost housing very heavily. They still had basic research on fiber and cutting methods, they were computerizing sawmills at that point to actually determine the most efficient pattern of sawing. I don't think there's any question that the Forest Products Lab was moving very rapidly at that time. Skyline logging came in, again in response to environmental concerns. There were some slopes particularly in the Northwest I guess where that was used more. Skyline logging, helicopter logging, and developing methods of treating logging waste. Project Skyfire had been emphasized for many years in the northern Rocky Mountains out of the Missoula forest fire laboratory. They had determined that cloud seeding could reduce the incidence of lightning fires. The only problem with that is that most of the major storm will have thousands of strikes. You can work on one cumulus cloud or maybe ten or twenty, but you can't seed several thousand over large areas.

HKS: Weren't there some lawsuits, or fear of lawsuits, from farmers that if you seeded you might take their rain away. A state farther east doesn't get as much rainfall and they blame Project Skyfire for doing this?

RKA: Yes, we had that occur in California a couple of times. You had always that possibility. In the Yosemite National Park, we had a very strong crew of forest insect researchers studying insects, impinging on the park, and they had put out the word once that in several areas of the park they were going to do some aerial control with pesticides. Bark beetles attacking lodgepole pine in higher parts of the park were causing some serious problems. It happened that the weather wasn't right and the spraying was postponed. You should have seen the articles that hit the newspapers. People were counting dead fish and birds that had been killed by non-existent spraying. I mentioned Jim Mace a couple of times, he brought us into that Operation Fire Stop. Jim had a very serious fire near Riverside in southern California. The crew was getting nowhere. Jim on his own very quietly went out and out of his own pocket paid for a cloud seeder to go up. There were big clouds right over the fire. A gully washer thunderstorm followed. They couldn't even get the fire fighters out of the fire camp. [laughter] It was not publicized at that time. And I don't know whether it's been used very much anymore or not. It's the only time that Mace tried it. [laughter]

HKS: I would imagine. So there's no question that the seeding caused the rain, it wasn't a coincidence?

RKA: I wouldn't think so. Again, I wasn't there but the cloudburst came at the proper time right after he seeded...

HKS: Pretty dramatic...

RKA: Over a big fire you can have smoke columns and clouds go to fifty thousand feet, so they're prime for it. A national fire danger rating system was developed at that time, which allowed you to compare the potentials for fires in different parts of the country. George Byram many years before had a fire system for the Southeast. Every fire research unit, I think, built its own fire danger rating system. We put together a task force of some regional people, but mostly meteorologists and foresters, who worked out of Fort Collins in Colorado. We moved one man from Berkeley there, and they developed a national fire danger rating system that is, as far as I know, with some modification still in use today. I think that was a rather important contribution. With computers there are mathematical models of mass fire behavior. I can

remember a series of charts that I'd pull out of my pocket to look at to predict what might happen to fires depending on changes in humidity, wind, temperature, or inversions.

HKS: One of the tasks I had when I was in fire research was to analyze all fire reports for Region 6. It was amazing to me that the primary cause of the fire getting out of control, a lot of these were escaped slash fires, was an unexpected wind shift of 90 degrees. So the front goes through and these guys don't know about it. They could get a weather forecast for 3,000 feet elevation or 4,000 but they didn't know. I mean the people on the ground, the ranger, apparently was not aware of the technology available. I don't know how accurate these weather forecasts were but you get weather forecasts. Those fronts came right over the regional office on their way to the Cascades. They could have had about a forty-five minute warning, or so. I'm talking about fifteen or twenty or thirty fires a year got away because a front went through and the guy on the ground didn't know it. And that's a pretty simple kind of technology. It's not exotic, it's not hard to understand. But that doesn't surprise you either, that the ranger...

RKA: We in research were heavily involved in fire training in California, and ours was related to behavior. We didn't try to get into techniques of control. Groups of fire bosses and fire control planners would have a two-week session almost every year. We taught how fires spread and such things as what were the signs that showed that the inversion layers were going to be penetrated. Look for little whirlwinds. Many signs wouldn't give you as much as an hour, but most were in the ten to fifteen minutes category.

HKS: Time to move some people from one side to the other.

RKA: I've mentioned Jim Mace and we're talking about fire. I have four slides that show this. There was a critical fire in southern California near Camp Pendleton. Jim was driving toward the fire camp and was five to ten miles away. On the east side was a bulldozed line and maybe fifty men with fire hoses that had been strung from the top down. I spent many hours trying to find out what he saw. He used his radio and said take the men off the fire line on the east side of this fire. He heard the radio going to the crew bosses saying roll up your hoses. Jim radioed again, drop everything and run, either up or down, whichever is closer. About ten minutes later that fire blew up and became a big fire storm in this whole canyon. Those were the things he was very sensitive to but in no way could he explain what he saw. The important thing is to have somebody on the fire with no control responsibility, always to look at what's this fire going to do and feed that word to the planner or the fire boss.

HKS: I remember being on fire lines about three in the afternoon. Somebody would come by and hand out a mimeographed weather forecast. At ten this morning there's going to be a wind shift. [laughter] We're talking about the subject that you said that you wanted to address, the application of research. All throughout your discussion here it's application results. Do you want to focus on that?

RKA: I don't have very much more in this area to talk about. I don't know whether you have any questions.

HKS: You mentioned the clearcutting of the Monongahela and the fine paper that Ostrom pulled together. Anything more on clearcutting from the research perspective that you'd like to talk about?

RKA: The use of clearcutting on the Monongahela came as a result of research findings. I don't recall all the details, but this was a low quality hardwood area generally, and in order to make it productive you did need to clearcut the areas and then either wait for natural regeneration to come in more slowly or plant. The details of that particular technology came out of research at the Northeast Station. What went astray was the combination of small clearcuts to form a large clearcut area. I don't think there was any question that there was too much clearcutting.

HKS: Even today?

RKA: Even today many environmentalists think that the Forest Service pioneered in the use and developed clearcutting as a method of timber harvesting and replanting. It's been used in the Black Forest of Germany for several hundred years and in Japan for three or four hundred years. I think there's a place

for clearcutting if you need to improve the wood quality of an area. In the redwoods and in parts of the northwest, if you do a partial cutting the wind will take care of the stand that's left.

HKS: There's been a lot of criticism of chaining juniper stands in Nevada and just getting rid of hardwood in general in the South. Does this grow out of research some way or do people in the field say the hardwood has no market value so let's get rid of it and plant loblolly pine. It's like poisoning a lake to get rid of the fish that aren't very sporty and putting in whatever they put in. Is research working on these kinds of broad scale things or is somebody misreading research results when they think that's a good...

RKA: I don't know. I'm a blank on that so I wouldn't want to comment.

HKS: Le Tourneau makes these huge machines, great big mesh wheels in the front, where they just smash down I don't know how many acres a day of hardwood. You probably don't need a scientist to talk about that, you just get rid of the hardwood and plant pine.

RKA: If your goal is timber production, that certainly is alright. I'm sure that research has looked at that in terms of the impact on the soils and the productivity of the area. Without question I know that they have, but I'm not aware that they're involved in the actual application. There was an aerial spray job in Arizona in some of the timber areas. Lawsuits were threatened. We sent Jim Beal and Ray Hansborough as part of a Forest Service team to get the true picture. It was a routine aerial spraying to control some insect, and I don't recall now what it was. In the little town they were telling how many of the gardens had been damaged and so forth and they said why there's a lady up here, up the road that has the prettiest Colorado blue spruce you ever saw in your life and for the first time in twenty-five years she wasn't even able to decorate it at Christmas time. The spraying ruined the tree. Ray Hansborough thought that that was a good case to look at and he went up and the lady came out and was talking to him and he said I understand you've got problems with your Colorado blue spruce, he said it looks alright to me. She said I didn't get to decorate it last Christmas because I was seeing my daughter in Los Angeles.

Fire in Wilderness

HKS: Fire in wilderness. Something you want to talk about?

RKA: Yes. You win some battles and you lose some. I don't have the exact date. The Park Service started a little prescribed burning in Sequoia National Park. Underbrush and ground fuels were building to the point that the giant sequoias could be damaged by fire. It was an excellent program done in small fashion, very carefully and just at the time when they knew it was completely safe. Other parks did some. Until that time the Forest Service had put out fires in wilderness areas. We didn't use mechanical means; we walked in and walked out. The general thought was that fire should be extinguished principally because it can spread out of the wilderness areas and become major fires. The policy became that in wilderness areas the Forest Service could, again under appropriate circumstances, measured by fire danger rating, let lightning fires burn. There's no question that that was a good policy as far as it went. I argued quite a bit in chief and staff and in other areas that if the conditions are just right so that if a lightning fire strikes we let it burn, why not drop the fuse and do it on purpose. Then you can start the fire where you want it, you can start it when you want it, and you know when it is going. Once you have a few fires that have been allowed to burn, then you can have even safer burns. There's no question that technically prescribed burning is a very sound policy, but it violates the wilderness area concept. It's alright if the lightning starts a fire, but it's not alright if man starts a fire.

HKS: Maybe if you had an Indian going with flint and steel and started it, it would have been alright. [laughter]

RKA: The interesting thing was the Yellowstone fires that drew national attention a while back, and the Park service was criticized for allowing some of the early lightning fires there to start. It was in the *American Forests* description of the fire situation and the Park Service policy. Park Service paid no attention to fire danger rating. They had areas where if a fire started they would let it burn. They of course completely ignored the conflagration potential of three or four years of drought plus insect battled

lodgepole pines. I was amazed that at the time of the Yellowstone fires, they still had just a strategy of allowing lightning fires to burn without any review or override by fire danger rating or conflagration potential. But I think, for the record, that the fire conditions were so bad at that time that allowing the lightning fires to burn didn't affect the final fire damage.

HKS: I was intrigued that one of the more frequent official spokesmen on nightly news during the Yellowstone fire was Dick Rothermel, who you probably remember from the Missoula lab. I thought that's interesting, I wonder how many people watching it realize he's a researcher rather than a dirt forester who really knows what it's about. As a matter of fact he's an aeronautical engineer, he's not even a forester, and yet the Forest Service trotted him out to talk to the media. He's an affable guy and articulate. Anyway, to you the issue was why not actually manage wilderness a bit.

RKA: And Dick had been studying fire for many years. Using only nature-caused fires is inefficient and sometimes dangerous.

HKS: Given the affection that the environmentalists seem to have toward fire, is it ludicrous to consider asking Congress to amend the Wilderness Act to allow this kind of management in the wilderness areas? Who would oppose it?

RKA: There are many people who would oppose it. A wilderness must be completely natural and you don't do anything in there deliberately. It would just never fly with the true wilderness lovers, who love the idea of the wilderness. I feel that people should be barred from many wilderness areas.

HKS: But it's alright to rescue someone if they're injured.

RKA: A young lady up in the wilderness area in the state of Washington fell and broke her leg, and her partner hiked out. I believe it was the local Forest Service ranger who instead of hiring a helicopter to pull her out in a few minutes took a couple or three days before she was out by sending in a crew after her. He wasn't a ranger too long after that as I recall. It is amazing, it's the same fervor that you get with some endangered species, and those all came about after I was there so maybe we don't need to talk about them.

HKS: The act was there during your time, but they didn't realize how significant it was going to be. You got out just in time, I think.

RKA: If I looked at changes through the period of time I was there, and again from the standpoint of enjoyment of the work and opportunity to do things, I was there at the right time.

HKS: Got a couple of letters here from people at the experiment stations. I said I was going to be interviewing you and Dickerman and Buckman and what should I ask these guys. Many wanted to ask each of you to come up with the three most important or five most important scientific issues of your administration. Fire and wilderness was one.

RKA: It was quite important, even letting some lightning fires burn was critical. Yes, it was an important issue.

HKS: Wasn't there a fire in wilderness in Minnesota that got away and caused a lot of damage and during fire review the ranger, or whoever had charge of the fire situation, was reprimanded? Well you don't remember.

RKA: It could be. There was one in Michigan, I think, a while back that did the same thing and there was one in Arizona. It was where those who had made the decision did not pay close enough attention to the fire danger rating and fuel conditions.

HKS: It may have been because of the people I worked with in Portland, Dave Bruce and Owen Cramer, we spent an awful lot of time talking about the national fire danger rating system. We made some field

trips, and there seemed to be a lot of opposition to it from the regions where fire wasn't so important--why have such a complex danger system when fire wasn't an issue. Obviously in California, the sky is the limit. You trot out whatever technology you have. Is there more to talk about on that system? You've referred to it.

RKA: No, I don't think so. It was difficult to get the same examination of potential for serving fires in different areas of the country with different rating systems. With different systems you might have difficulty in determining the priorities for adding manpower or equipment where you're stretched pretty close to the limit.

HKS: So much of my observations from that time of research was based upon being an entry level scientist. Everything was new to me. I was observing and marveling at what was the problem and what wasn't a problem. One of the problems obviously was then and always will be, the U.S. is a very large complex ecosystem and a single anything is hard to put out in the field.

International Forestry

RKA: Yes. I'm down to "international."

HKS: Okay, let's go for it. There's quite a bit to talk about there. Does it make sense to you that international forestry was in Research as opposed to National Forest Administration or State and Private Forestry?

RKA: That makes a great deal of sense because the International Union of Forestry Research Organizations was the first worldwide research organization. Now there are thousands of them in every field that you can have, but that was number one. It came about because of the Swiss and the Germans want to look at each other's sample plots way back in the 1800s. The bulk of the international exchange to date deals with research. We did send foresters to developing countries and other places. The principal impact and the principal advantage to the U.S. was in research. I may have a little bias on that. One issue in international forestry was the balance of participation among international programs. You had FAO programs, we had the North American Forestry Commission under FAO. We had IUFRO which is the International Union of Forestry Research Organizations. And then because it was assigned to the deputy chief for research, you had to have the balance between U.S. research and international work. We had a few scientists who wanted and tried to spend all of their time in areas of international interests. Of course you can overdo a good thing. It did revolve largely around research, which is the direct communication between parties. Public law 480, which utilized local currencies, particularly in developing countries and elsewhere in Scandinavia and Germany and Italy. They couldn't pay us for whatever services might have been done in U.S. dollars but they would build up in our embassies foreign currency funds. Those were used to finance congressional travel in countries, and used rather widely for that. They also were earmarked, some of them, for research by foreign scientists. That meant that we had to know the people that were in forestry research in other countries and know what their capabilities were.

HKS: So when you got to India then you would switch to their payroll as it were, and they would finance salary and everything.

RKA: No, no they wouldn't finance anything of ours. I can't recall that we financed any travel out of PL 480 funds. Let's say that we had two hundred thousand dollars in Germany, and we were interested in several research areas. We would ask for grant applications.

HKS: So German scientists could apply to do the work, okay.

RKA: They applied. We got a lot of research work done at a low cost to us.

HKS: I could see that.

RKA: I guess two-thirds of it was handled directly by the Washington office staff. But in many areas the key person who knew most about that problem was a research scientist in the field. He would be put in touch with the appropriate person and would evaluate the grant proposal and so forth.

HKS: Was there much difficulty dealing with different standards of research in different countries, different cultures?

RKA: Yes.

HKS: The quality of the product, was that generally acceptable?

RKA: Yes. That was our job to see that it was. Most research was in universities. I would say there wasn't a real problem. When we started cooperating with Russia we had a problem with research quality--some very good and some poor. In Russia some research results were ordered to conform to communist thinking.

HKS: I would assume for some countries where there is large amounts of foreign aid, there was almost a problem to find enough things to spend the money on.

RKA: No. I guess maybe eight or ten million dollars was as large as it got with us, and when I was in Washington it went down to two or three million.

HKS: The only direct observation I had with PL 480 was at the University of Washington library. A certain number of libraries in the U.S. were selected to receive every publication in India, all the newspapers, all the books, just bales of stuff would come into that library on India and in Indian languages. We would call them the PL 480 books. No one was really aware of what that meant, but if you were a specialist on India you were in hog's heaven. You had the local newspapers, you had the whole works. So I guess we used that money for a lot of good purposes.

Soviet Union

RKA: I think so. It was a good program, it was certainly cost efficient. Probably the major contribution in research was the actual scientist to scientist interaction. You develop close professional relationships that really paid off in exchange of information, both by letter and at scientific meetings. One other thing that international research did was to improve the relations between countries. When Nixon started with Russia, he authorized cooperative research interchanges and we were part of that. We had to use our own money, we did not get extra funding. We had three different missions that I know of to Russia. George Jemison took one and John McGuire took one. That was kind of interesting, I was the organizer and John was the head of the U.S. delegation. The head of the Russian delegation was not a forester. He was an ag economist and took John off with him. I had a title something like program manager. Their program manager and I did all the negotiations while John got to see a lot of Russia.

HKS: The photographs you've given me show you and John at the dinner table, and John and you are laughing, someone standing up says something funny, probably the translator, but...

RKA: That's true, and that was not a dinner, that was just a part of the working sessions. I got in personally on one other one--one of NASA's. If you recall, we had pretty well severed diplomatic relations with India back in the 1960s. As a start towards normal relations, a Pugwash group of scientists went over to negotiate cooperative research.

HKS: Is that an acronym, Pugwash?

RKA: No, Pugwash is a town somewhere up in Nova Scotia. I don't know very much about Pugwash. A group of scientists who developed the atom bomb, part of the nuclear weapons, got together to try to make sure that they were never used. They were a policy-forming scientific group. Roger Ravelle was one of those, and he was requested to form a Pugwash group and go to India as a start at reestablishing

relations. It was in agriculture, forestry, and in other industrial applications. Although we were briefed by the State Department, the State Department could have nothing to do with this, it had to be a private venture. I went while I was at the University of Texas. It was another example of using scientists to begin to open diplomatic relationships with other countries.

HKS: Is there any more to say about the work you did in the Soviet Union specifically? You talked about the quality of research, was it because of lack of training?

RKA: No, part of it was lack of equipment, part of it was the size of their research program. They wanted a lot of what we have, their people obviously had translated almost all of many publications from the U.S. in forestry. They had some fairly good work on insect and disease, biological aspects of that. Their forest genetics people were told what their results were going to be before they did the research.

HKS: Is that the aftermath of the so-called Lysenko business of the '40s?

RKA: Yes, and that was beginning to change.

HKS: That's amazing that was still there in the '70s, right?

RKA: Yes, it was changing then. But they had to be very careful. Their forest economists were quite able people.

HKS: That's interesting. All the problem the East Block is having now privatizing because of a lack of economic structure or experience.

RKA: I think it was a matter of individuals. The head of their delegation was an ag economist and my counterpart at the negotiating table was an economist.

HKS: What were you negotiating?

RKA: We were negotiating exchanges of scientists and agreeing to exchange plant materials.

HKS: Is it supposedly a one on one, was that the goal? You did something for the U.S., and the U.S. would do something equal for you?

RKA: About every two or three years, we went over there and they came over here. I don't know since I left how many, at least one trip over here for them, and I'm sure we've been back, but we've had several scientists spend several months to a year over there and they've had some scientists here too.

HKS: Is most of their work in Siberia where most of their forests are, or where you in the European part?

RKA: We were in the European part, we didn't get into Siberia.

HKS: It's a big place, you don't just jump over to Siberia for a field trip.

RKA: When I was there with NASA, they were antagonistic--both sides were. We were supposed to exchange photographs from space. We were not allowed to admit that we had taken pictures of anything that could be discerned smaller than a football field, when we knew we could almost read the newspapers. But we would admit, only to that, and they initially said they had never taken a photograph in space.

HKS: This is all pretty silly when you look back at it.

RKA: We went back and forth for four or five days. The assistant secretary of NASA who was heading the project came into my room. Of course our rooms were all bugged as we knew. He said Keith, if those Russian SOBs don't lay photographs at 9 o'clock in front of me tomorrow morning, we're going to tell our

ambassador that they're not cooperating and we failed. At five minutes till nine they placed a big batch of photographs on his desk. [laughter]

HKS: You stayed after the official group left.

RKA: Yes, I stayed and met with their forestry people through the agricultural attaché. We set up the general plan for the forestry exchange. In contrast to the NASA exchange, the forestry exchange was completely friendly. We had what they needed and wanted very much. We wanted to get acquainted with their work. We had many pleasant dinners and this sort of thing. They asked us where we wanted to go and we were allowed to go. We were a small busload, I think there were five of us and maybe eight or ten Russians. They even closed schools in some small towns to wave American flags as we went through. It was a completely different setting. Of course we knew some of the Russians through IUFRO. There were several who were regular attendees at IUFRO, and out of it came a definite scientific exchange. Our orders were to be sure that we did not give them a big advantage over us, because we knew that they didn't have as much as we did. But we got quite a bit out of it and they got quite a bit more.

HKS: My only experiences or observations with Soviet scientists is through IUFRO. It seems like they're always the first in line when the doors open for the receptions. They stormed the food and drink tables ahead of everyone else. If you're in front of them, they would walk on you.

RKA: You've got to remember that some of the Russians were KGB people who made sure that they talked only about forestry. At the World Forestry Congresses their security people were quite evident. Actually, their scientists were as friendly as they were allowed to be, and they were never pushy. It was international forestry that created a lot of the overload that led me to request and get a second assistant deputy. There's no question that the work exchange through IUFRO had grown a great deal with Harper and Jemison.

IUFRO

HKS: Did you feel any sense that you had inherited a commitment to IUFRO through Jemison?

RKA: It was a Forest Service commitment to IUFRO in research, and I'm not complaining.

HKS: Did you personally have to be high profile in IUFRO the way George and Les Harper were?

RKA: Yes. I was on the executive board for a number of years and led a protection interchange group before that while George and Les were still there. I didn't know I was being groomed for some future activity. There's no question that it took a lot of time. We had the World Forestry Congress in Argentina, and of course the U.S. participation with that fell directly on our shoulders. There were about thirty or forty Americans down there. FAO at that time was taking a greater interest in forestry, and they elevated the forestry and forest industries division to a forestry department with two divisions, headed by an assistant director of FAO. The headquarters for agriculture and forestry were in Rome. We had a number of meetings there to bring FAO along and to hopefully increase FAO support for service foresters in developing countries. The North American Forestry Commission's activities in Mexico, Canada, and the U.S. also took time. I don't think we got as much out of that, nor did Canada, as the Mexicans, but I think really the North American Forestry Commission was a real help to productive forestry in Mexico.

HKS: At the SAF meeting in Albuquerque, you were president of SAF then. I heard comments. The American foresters were really surprised at the low level of technical background the Mexican foresters had, those who came to Albuquerque. Theoretically they would have been among the more advanced, they were bilingual they could read English and keep up and so forth. So maybe what you say is the issue, how to bring Mexico along.

RKA: It certainly was in forestry. They had a few able people, but politics was involved in every decision made in Mexico. All political decisions, very few professional decisions.

HKS: Is that right?

RKA: In terms of forestry.

HKS: Give me an example of that. A decision was made that was not good forestry but it was good politics, does something come to mind?

RKA: Not specific examples, but the location of industry, the nature of cutting, even their participation. They had to be very careful of what they said in the meetings.

HKS: The forests surrounding metropolitan areas must be really be harmed these days...

RKA: Oh, there aren't any. They were cut for firewood.

HKS: The concept of urban forestry doesn't really work in Mexico.

RKA: No. Of course Mexico City has lots of shade trees and that sort of thing, but not in the poorer parts of it. The southwest region of the Forest Service, and particularly out of Albuquerque, had very close ties with their Mexican counterparts and they had joint meetings every year.

HKS: I would think that State and Private Forestry would be emotionally oriented to a lot of this international work, but apparently it does not get involved.

RKA: No. Probably because of the nature of their funding.

HKS: The kinds of cooperative activities that they deal with with states would work very well with Third World and so forth.

RKA: Never even heard that brought up before this time.

HKS: Speaking as an outsider looking at the agency and the kinds of tasks it takes on.

Central Intelligence Agency

RKA: Research is the most important and by far the largest exchange. Anyway we had some two hundred nationals from other countries that would visit this country every year for professional forestry training in the forestry schools. We arranged trips for visitors and developed their itinerary. In one year visitors spent twenty-eight hundred man hours with Forest Service people. It had to be organized and managed. I guess it's not classified anymore, but we had a fairly sizable international forestry staff, maybe eight or ten people, who were studying purely the forestry potential, the forestry programs in various countries for the CIA. It had nothing to do with clandestine operations. Those reports were available to anyone.

HKS: The CIA would fund that?

RKA: Yes, they were funding it. But again, the reports were not classified, the source of the money was the only thing secret.

HKS: Oh, I see.

RKA: If some industry or someone wanted a report, we would send them a report on the country.

HKS: When I was a senior in forestry school, taking photogrammetry, using Steve Spurr's book, the CIA would come on campus to recruit. They always wanted to recruit a few foresters because of our alleged skill with aerial photography interpretation. They wanted two foresters, young graduates, to go to Europe

to do photo interpretation. I guess there was a lot of that going on. But it was open, I mean we were told it was the CIA who wanted foresters to go to Europe.

RKA: Yes, our work with the CIA was not classified except for the source of the grant money. Why, I don't know. It was there when I came in and was there when I left.

Security Clearance

HKS: You made an observation, I think it was you, at the Denver Fire Research workshop about Jack Barrows. He was being considered for some Washington position and the one thing that hadn't been completed was his security clearance. I wondered what these guys do in the Forest Service in Washington that requires a security clearance. This is the sort of routine thing you're talking about?

RKA: No. That security clearance was a different matter. Any chief or deputy chief or key person in Washington may need some security clearance. At the chief or deputy chief's level, it's secret or top secret, that sort of thing. Some space projects or advice requested from DOD may require clearance. A. A. Brown was retiring, and Jack was being considered to be the director of the Division of Fire Research in Washington. The Armed Forces Special Weapons Project is an example. We weren't even supposed to tell our wives where we were going. There is one story about that that I think I should mention. There were many tests that require recorders to be turned on. You might want camera lenses opened up or whatever. We had a lot of beds of various kinds of fuels that we had covered up to keep the dew from forming on them. We wanted a minute or two before the bomb went off to uncover the fuels and start recorders. DOD called them blue boxes and charged three hundred dollars for each one. We needed fifty to a hundred of these blue boxes at three hundred dollars apiece, and to us dirt foresters that was big money.

HKS: Big money.

RKA: We determined that we didn't need anything more accurate than five minutes. I bought two hundred Big Ben alarm clocks at one dollar eighty-nine apiece. We put them all in a room in the Berkeley Experiment Station and wound then every day. When the alarm goes off, the winding mechanism unwinds, and it's very strong pull. We hooked wires onto the stem and had them pull pins. Then we put two on each task so that we had two chances for success. We had window blinds over our fuel beds. A pulled pin released the blind and it would go back and expose them.

HKS: It was a very high tech operation, it sounds like.

RKA: It was. The funny thing was that on every one of the first three bomb tests we had 100 percent success. The $300 blue boxes worked as needed about 75 percent of the time. [laughter]

HKS: That would be a good testimonial for the guy who makes these clocks. We were talking about security clearances.

RKA: They were routine. In the Armed Forces Special Weapons Project we started to employ a fellow who'd been in the Forest Service for some time. His security clearance noted that he enjoyed cocktail hours and usually talked a lot. We couldn't get him security clearance, and we weren't allowed to tell him that that was the reason he couldn't have the job. Another international matter was that Tom Gill was interested in international affairs. He was concerned that most international cooperation came via research. The practicing professional forester had little opportunity to meet with his counterpart. That was important to developing countries. He was most concerned about developing countries. So he and Les Harper organized the Union of Societies of Forestry to help other countries develop professional societies of forestry comparable to the SAF. The SAF supported it in general. When I became a deputy chief I inherited that activity. It was the job that I didn't care to inherit, because it took a lot of time, it wasn't overly productive at that point, yet it was important enough to do and it looked like I was the only one to work with Tom Gill to continue it. In 1974, I organized and directed in Finland the Second World Congress of Foresters. It gave emphasis to societies and how they could support education and training.

HKS: Tell me a little bit about Tom Gill. We have his papers, and in there is a whole box of tapes. We thought gee, Gill must have interviewed a lot of folks. It turned out it's all the classical music he liked to play.

Puerto Rico

RKA: We might pick up Tom Gill when we come to the SAF.

HKS: I think this fits under international issues. We're in a process of completing an agreement with the Forest Service with international forestry for me to interview Frank Wadsworth, who's been in Puerto Rico since 1942. What would you ask Frank Wadsworth about?

RKA: The Puerto Rican National Forest was run by him through research for some time. Now it is administered by the Southern Region. Let's back up a little bit. Frank and I were graduate students at Michigan at the same time.

HKS: I didn't know that.

RKA: We shared an office, so I got very well acquainted with Frank. As foresters we were concerned, this was a forty or fifty year old wooden building with oiled floors. With each step oil would come out. We were writing our thesis, but because of fear of fire we made a copy of everything and kept it out of the building. It didn't burn while we were there but two years later it burned to the ground and destroyed I don't know how many theses. Frank was interesting. He married the daughter of Gus Pearson of southwest fame. Frank worked with Gus for a while in Flagstaff. I think it was before his Ph.D. work, and at this point I don't know how Frank got to Puerto Rico.

HKS: I talked to him on the phone for five minutes. I asked him that and he said he married Gus's daughter, the law on nepotism came in, and he had six months to change where he worked. This story I'm sure has been embellished over the years, but the first job opportunity that came through was Puerto Rico. He said we had to go look at a map to find where it was.

RKA: They were working on the first experimental forest of the United States at Flagstaff.

HKS: Fort Valley.

RKA: Fort Valley, yes. I think he saw the forest in the broad sense of its major contribution to mankind as well as to production of wood. He progressed down in Puerto Rico till he was the forest supervisor. I don't recall whether that was his title or not, but he was responsible for the forests as well as research. He was brilliant, well trained, and so he has become Mr. Tropical Forestry over the years. I had one conversation with him about coming back and taking some place in the U.S., but he wanted to stay there all his career, which he did.

HKS: He still works.

RKA: Yes.

HKS: He must be just about the senior employee in the Department of Agriculture.

RKA: I would think so too. I'd assume he's about the same age as I am.

HKS: Well it's fifty-one years he's worked for the agency in Puerto Rico, and had several years before that in the Southwest.

RKA: The Puerto Rican parrot came on the endangered species list, and Frank was greatly concerned. He worked with the department on endangered species. They had built at the ARS research center, just

out of Washington, a special cage and had raised other parrots to be sure that they could handle the endangered ones from Puerto Rico. It came time for them to bring the parrots to the U.S. I got a phone call from Frank and he was just frantic. The parrots were sitting down at the airport and they were holding a DC-7 airplane flying into Miami, all introduced plants and animals had to go into Miami and be held there until they were declared to be healthful. They were worrying about the Newcastle's disease. Newcastle disease had wiped out millions of chickens in California, and Florida was concerned because Puerto Rican parrots had been known to carry Newcastle disease. They wouldn't allow them to land in Florida until someone would indemnify the state of Florida for damage if Newcastle's disease spread from these parrots. A few calls around to the secretary's office found that nobody over there had the slightest interest in indemnifying Florida. [laughter] Stupid me said that I would sign the indemnity, which would allow Florida to sue somebody. So they brought the parrots over and by golly about two months later one died. I can tell you I lost a little sleep over that.

HKS: Sure.

RKA: But it turned out they were taking so many blood samples, checking for Newcastle's disease, that that's what killed the parrot. Anyway the parrots got to the research center out of Washington, ARS. They've successfully bred and moved parrots back and apparently now, I don't know whether it's endangered or not, but there are many more parrots in Puerto Rico.

HKS: Frank sent me a copy of an extraordinarily detailed resume. Apparently the agency requires it every so often when you're up for a certain review or maybe a promotion at a certain level. We're talking about a thirty-eight page summary of his career. What impressed me about it was the number of trips he took. It looked as though whenever the work tropics would come up in Washington, D.C., somebody said let's get Frank to take care of that.

RKA: That's correct.

HKS: About two-thirds of the world was his beat. He couldn't do any work in Puerto Rico, he was going someplace, on a committee, making a study, filing a report. Who else, I mean Frank really was it initially, right?

RKA: Yep, and he was highly respected worldwide. He could represent the U.S. in excellent fashion.

HKS: Let's get back to going to Congress and asking for money. Was tropical forestry a tough one to sell at budget time? Or were you trying to increase the amount of money available, to have more Frank Wadsworths.

RKA: No, we did not push tropical forestry, because there are few tropical forests in the U.S. Hawaii is mostly semi-tropical and the tropical part of Hawaii is not important.

HKS: I was thinking more in terms of the Forest Service hiring a Brazilian scientist to work full time for the Forest Service, or some other tropical nation. But that wasn't on the agenda then.

RKA: No. We tried to strengthen forestry in Puerto Rico. Frank was assigned because he was there, knowledgeable, and spoke fluent Spanish. But no, there was no big attempt to get on with tropical forestry. Carl Ostrom was knowledgeable in it from his viewpoint as division director of forest management research. We had a few other people who had worked in the tropics. I don't recall who at this point. But Frank did most of the work. Ostrom went to quite a few meetings over the years where a broader viewpoint was needed.

HKS: Of course the Forest Service was acquiring through normal process a lot of Peace Corps returnees that had hands-on experience. They had been trained in forestry, maybe came back and went to grad school, so we're building up a potential infrastructure for tropical forestry in the U.S. That wasn't the plan but it happened that way.

RKA: Yes, Yale and Syracuse had excellent programs in tropical forestry.

HKS: I had on my suggested outline the translation services. I guess I got that out of the chief's reports. Was that a USDA function or were you guys involved directly with that?

RKA: You know, I don't know.

HKS: It's in the chief's report for some reason.

RKA: We tried to translate key materials. We didn't translate nearly as much as other countries did, for example, Russia. I can't tell you how it was done. Dickerman or Buckman probably know. But it wasn't a big operation. It might have been under contract with the Library of Congress, I'm not sure. It was not adequate. We lost a lot, and our individual scientists had to work their way through papers if they knew a little bit of German or French or Spanish, or they paid out of their research funds to have translations.

HKS: Okay, let's shift gears. You're at the SAF meeting in Albuquerque.

RKA: I had promised the head of the Mexican delegation that I would welcome them in Spanish. I wrote out a speech and had a friend of mine who was fluent in Spanish put it into Spanish on a tape. I drove from Austin, Texas, to Albuquerque and played that tape all the way, and learned my speech in horrible Spanish. He was fluent in English. The comparison was not a good one. [laughter] I guess we're about ready for the University of Texas.

University of Texas

HKS: What's the background? Had you been talking to Steve Spurr over the years about joining up with him, or was this a sudden thing?

RKA: This was sudden, as most of my changes were. I had told Ed Cliff when I returned to the Forest Service that I would come back until I was eligible for retirement, which was about five years. I'd always thought of going back to universities to teach a couple of semesters and enjoy part retirement in nine-month appointments. I'd looked around the United States several places, and John Grey at the University of Florida had offered me the job that Les Harper had had down there, which was a position I liked. I didn't care for Florida as a place to live as much as some other places. It was a little too far from the West. One night in the spring of 1973, Steve Spurr called me. I think we were even asleep, it was 10:30 or 11 o'clock. He said he had a position at the University of Texas that he had been trying to fill for several months but could not find the right person for it.

HKS: He was president at that time?

RKA: He was president.

HKS: Okay.

RKA: He said the position was in the Division of Natural Resources and the Environment, which was a catch-all for anything that they didn't know where to place administratively. The University of Texas had no vice president for Research. This unit was responsible for the McDonald observatory in west Texas, for oceanography and the marine science institute, for the geological survey of Texas, and several other small units. It had one other professional, Ross Shipman. As usual, I was fortunate to have an excellent co-worker. Ross knew the university inside and out and he knew the Texas legislature the same way. We enjoyed working together and had a great time. My academic appointment was in the LBJ School of Public Affairs in which I would give one seminar a year. The rest of the time was in the environmental program. I told Steve before saying yes that I had never been to Austin, and if he would move the university to someplace that was out of Texas, I'd consider it seriously. All he said was pay us a visit. We went to Austin and liked it. And we thought that it was an ideal place to work for a few years and retire then in Austin. Without telling Steve, we bought a house before he made a formal offer of the job.

HKS: I spent a Halloween in Austin, and I was impressed by how seriously people take Halloween in that part of the country.

RKA: There are lots of neighborhood block parties. I think they were designed to keep kids off the streets. On the day that I was eligible for retirement from the Forest Service we moved to Texas and took up this job. As far as the administrative part of it goes, it was very much like that of a deputy chief or dean, working with university scientists. There were some very able people in the McDonald observatory and marine sciences and the geological survey. It was really enjoyable to work with those key people. There were some problems that were unique to Texas. I found out that at the University of Michigan most problems were kind of buried. They were not publicized. In Texas any time you had a major problem you would run it up the flagpole so that everybody could see it. They're out in the open. I enjoyed the LBJ school and became acting dean about a year after I was there. The dean at that time had two or three DWI problems and had some problem with drinking, so he was removed from office. There were two factions of the school, neither one wanted the other faction to have either an acting or a regular dean, and they both considered me neutral. I ended up as the acting dean. In fact I was acting dean twice after the dean left rather suddenly to head up President Carter's federal personnel office. Elspeth Rostow, the wife of Walt Rostow who had been on LBJ's staff, was a most able person. She taught at the U.S. War College. They'd send a plane down for her, and after teaching she would be flown back to Austin. She was named dean. She accepted on the premise that I would be the associate dean. She did a lot for the school, both bringing the faculty together and increasing outside support remarkably. She and her husband taught public administration together. She would let nothing interfere with that one day a week. In fact it was taught live and on TV at the same time. She was most innovative.

HKS: Did you have a chance to get to know Johnson himself?

RKA: President Johnson had died. I got well acquainted with Lady Bird, however. The Johnson library of course was right next to the school. Lady Bird had some oaks dying on the Johnson ranch. We had that point of contact also. You'd be in your office in the LBJ school. A bright young man, probably thirty, well dressed, would come walking in or stick his head around the corner and disappear. About five or ten minutes later Lady Bird would walk in. And she usually had something related to the library that she wanted assistance on or quite often just invited me to a social occasion. One time she had all of the key staff (secretaries of departments) under Johnson there for several days. There was a dinner that happened (another one of my lucky times) when I was acting dean. So Lillian and I were invited. They exchanged stories about "the old man." She was remarkable. She knew everyone's name and used it. She'd go out of her way to introduce people, and made it difficult for the Secret Service young men to stay with her because she was just very friendly and knowledgeable. And she also knew how to get work done, too. We might just talk a little bit about Steve's firing at the university. Steve was a very able university administrator. Faculty appreciated him and respected him and trusted him. Students, it was unbelievable how he managed to maintain rapport with students. He taught an introductory course in forestry just because he wanted to teach. He never wanted to be in a university without teaching. He taught just that one course, but it gave him a tie with students, some three to four hundred at a time. The chancellor at that time, the head of the U. T. system, thought Steve was after his job. I don't recall his name, he was apparently quite able politically, but I'm showing a little bias. He was not a strong chancellor in my book. The chancellor did all of the contact work with the legislature on budgets. The presidents and others in the system deferred to him because he was the budget contact. He was afraid of Steve and he needn't be. Legislators, anytime they had a question about the university they would call Steve, and Steve, immediately on every call, and I know this for a fact, would immediately apprise the chancellor that so-and-so had called and asked this. Steve suggested many times that they call the chancellor. But the chancellor took all of this as a threat. Right in the middle of the budget session, when he was meeting with the legislature, he fired Steve. Steve had had open heart surgery several months before. He called Steve in and said you know you're really on kind of a slow bell and you've had this heart problem. Wouldn't you like to retire? We have a house out here that you can live in it as long as you wish and we'll provide you a car at the same time. Of course you'll have an office and a secretary. Steve said well let me think about it. Steve knew what was going on and he didn't want to be bought off as had others. This was not unusual at the University of Texas.

HKS: I understand that.

RKA: It had happened before. Anyway, Steve went in and told the chancellor the next day that he'd decided that he would not retire. The chancellor said well then I'm removing you today from the office of the president. He said of course you're a tenured professor in the LBJ school, but I want you out of the president's office within forty-eight hours. If it hadn't been in the middle of the budget session, my guess is that the Board of Regents would have removed the chancellor rather than Steve. But there was no way to do that without upsetting the budget process. Lady Bird refused to vote on the matter. They confirmed what the chancellor wanted. The chancellor said this is it. But if it had been done at a time when they had some time and could adjust, I'm fairly confident that Steve would have been there. Not in the chancellor's position, but in his president's position.

HKS: Was he unduly upset by being fired?

RKA: He was upset, obviously. He was my boss one day and the next day, since I was acting dean of the LBJ school and director of the Division of Natural Resources and the Environment, I was his boss. His academic appointment was one half in each unit. We had many laughs over that. Surely Steve was upset but not emotionally. I was at the national SAF meeting in New York when I got a phone call at 3 o'clock in the afternoon that this was going on. I left on the 6 o'clock plane and got back to Austin. All the faculties were protesting. In fact they were unable to hold a university faculty meeting for over a year because no quorum of professors would attend a faculty meeting.

HKS: That must have been rather devastating for a lot of the programs.

RKA: Well, they went on. The regents appointed a vice president of the university, Maureen Rogers, as acting president. It seemed that the chancellor thought that maybe she was weak enough that he could control her. It turned out that Maureen Rogers was a very strong person. She ran the university and was eventually made president in her own right. But Steve just went right along, he started some research and more writing on his own. He gave seminars in the LBJ school. It was at about that time that the Parkinson's disease caught up with him and he was a little bit on the slow side. He never gave up or evidenced anything but that he had a life to live all the time.

HKS: Would you characterize the university as being less rough and tumble than the Forest Service? I mean both in their own way could be rough and tumble.

RKA: The university, both Michigan and Texas particularly, was much more rough and tumble. I can give you one example. I was acting dean in the LBJ school. A phone call came to my secretary; a Mr. Head, who was a legislator, wanted to come up and see me. And she said well Dr. Arnold has so-and-so appointments and what not and whoever it was on the other side said Mr. Head will be there at 2 o'clock. I immediately called the president's office to see who it was. He was the chairman of a subcommittee on university budget.

HKS: Important person.

RKA: He was important, so obviously I had time for him. He came in and was very pleasant and said he had just been reelected and that his campaign manager had a Ph.D. in English. He had promised his manager if he were reelected that he'd have a tenured professorship in the LBJ school. He said, do it now. I stuttered around that we didn't have any positions or funding for such a position. He referred to my ignorance and said that those could be provided without any question. I said well I'll talk with the president's office. He says you call me tomorrow. We obviously would not think of a tenured professorship. We did plan a research unit in the use of communications in the federal government. We got enough money out of the president's reserve fund to pay a good salary and a secretary and travel expenses. So I called Mr. Head the next morning and said that I was just pleased to be able to accommodate his needs and that we would look forward to so-and-so, whatever his name was, coming in. He uttered a few four-letter words when I described what we had done and hung up. When the LBJ

School budget came out from his committee it had changed from about a million dollars a year to zero. It passed the House of Representatives at the zero level.

HKS: Oh God, rough and tumble as they say.

RKA: Three days later, I learned that Mr. Head (the legislator) had borrowed money for his campaign from a west Texas bank and from a bank in Austin. Both of those loans were called. Anyway, you were asking about rough and tumble, that's it. The university was well run except in the research area. I enjoyed working there. I think it is important to know how Steve reacted to all of this turmoil. It did not affect him as an individual. He wasn't bitter about it at all, he knew the risk that he was taking and lived through it. Shortly after Maureen Rogers was named president, she established a vice president for research. I think it's something Steve would have done because it obviously was needed. We had about eighteen to twenty million dollars worth of research going on in the university and no oversight except on those few things that were in the Division of Natural Resources and the Environment. Eldon Sutton was brought in as the vice president for research, and I was the assistant vice president, which meant doing about the same things that I did in the Division of Natural Resources and the Environment, but on a broader scale. The job became almost identical with that of deputy chief.

HKS: Is there a medical school in Austin?

RKA: No, the medical school's at Houston, and there was a medical school in San Antonio. We had a nursing school but no medical school. As we began the work in research, we found a large number of research units, institutes and so-called research programs. Someone would have received a grant of some kind. He or she would immediately print some stationary, hire a part-time secretary, and be a research institute. We devised a system of a standard charter to describe the work of research units and funding, and of course listing the publications and so forth. It took about two years to review all of those with a research committee. The legislature didn't fund research at the University of Texas at Austin for one year. We had a two or three million dollar state budget. We used that to close down a lot of these small units who had been getting by. When research funds were reestablished, we were able to start financing key young scientists to start their research careers.

HKS: Was this before the oil boycott? I'm just trying to think what happened to the revenue in Texas.

RKA: This was well before that. I was long gone from there so I had no contact with those hard times. My position was also that of a handy man for the president. If there were a special recruiting job, I quite often went off and worked on it. In the case of several firings of key people in the university, I was the one that did the actual notification. The same thing went on with Maureen Rogers, I had a good working relationship with her. On one Friday we had to fire the director of the Marine Science Institute. Marine science was big. We had a big biological station at Port Aransas, and at Galveston we had ocean-going research vessels with geologists and others involved. This individual is a renowned scientist, but used his sexual proclivity to keep young people working for him. We fired him, and he promised, because he had close ties to the governor's office, that that would be changed on Monday. On Saturday morning the president called a meeting to select me as acting marine science director.

HKS: You'd taught navigation after all, so...

RKA: But nobody knew that. It was quite disconcerting to the marine science people to have a dirt forester run marine sciences. Actually the biological research part was quite easy. Whether the medium is soil or whether it's air or water, the basis for apprising and helping scientists is the same. I didn't tell anybody of my four years in the navy. That experience was most helpful in directing the activities in marine geology. We were talking about the rough and tumble stuff. The one who was fired didn't exactly go out peacefully. The rear window of my car shot out one time when I was driving to Port Aransas. He had my telephone tapped. He wasn't that smart and I never could figure out how he knew everything that was going on and reacted in advance to it. We were trying to eliminate him as a professor as well as an administrator. It takes a little time to remove a tenured professor.

HKS: Sure.

RKA: I retired then from the university on the planned date of retirement. They found later that the telephone had been tapped and it monitored all calls out of the marine science director's office.

HKS: The extraordinary importance of the oil industry to the health of the Texas economy. When you're studying natural resources policy there's a lot of opportunities to criticize the oil industry for this that and the other thing. Was that an issue? Was anything off limits?

RKA: No, never. I was not involved with oil. That teaching and work was of course in the school of engineering. It was a large school and well financed. You see the LBJ school of public affairs was principally to educate people in the public life and public administration. We had no one giving seminars or related to the petroleum industry. We might bring SAF up here, it was occurring during all of this.

Society of American Forests

HKS: Yes, that's fine.

RKA: Except for meetings and papers and incidental contact, most of my professional activities at that time were related to the Society of American Foresters. Early on in California I went through most of the chairs, committee assignments and so forth.

HKS: Okay.

RKA: It was the northern California section that decided that they wanted to put me up for president. That's how they made the nomination, and since I was well known in the Forest Service and had strong ties to the West and some to the South, I was elected. I was a member of the SAF council for six years, and of course the presidency is a longtime commitment. Two years as vice president and two years as president. I was to change that to one year at each level. This was the time when the SAF was flourishing. We had over twenty thousand members. Now I guess we're down to seventeen or eighteen thousand. Anyway, I was president in 1976 and '77, and I was vice president when John Beal was president in the two years prior to that. A vice president can have his committee assignments lined up. He doesn't have to wait till he's president, he can be ready to move. But if you organize in that year as vice president, you are ready to go. Several able people I know would not commit themselves for four years.

HKS: When you were a candidate, did you have a platform as such?

RKA: I don't think so. I can't remember. We all write out what we see was the need for SAF and right now I couldn't tell you what I said, except to be of service to the profession and to represent the profession in major policy issues.

HKS: If you had been still with the Forest Service would that have been a problem, in terms of the Forest Service concern about being too dominant in SAF.

RKA: No. Charlie Connaughton was president of the society.

HKS: That's true, he was.

RKA: I was nominated while I was still in the Forest Service. Even before Steve Spurr had called me about Texas I talked with John McGuire. If I accepted this opportunity to be nominated it certainly would be demanding. I knew of Connaughton's problems in California. John agreed with me if we needed some extra help in the deputy chief's office. We thought we could handle it, because I had the two associate deputies. It would mean maybe 20, 25 percent of my working time to do it right. John just said well you work on what you need and we'll make it go. Even before I accepted at Texas I pointed out that if I were elected that was a major program that I would have to devote time to. That was no problem to Steve as long as I did the work that was at Texas. A lot of time comes out of nights and weekends. The

Washington headquarters property developed through Tom Gill, and I think that that's something that you might want for the record.

HKS: Definitely.

RKA: I worked with Tom Gill on the International Union of Societies of Foresters. In 1969 Tom asked me to join him and Gifford Pinchot, Jr., for lunch at the International Club. At that lunch he propositioned Gifford Pinchot, Jr., to join him in financing a headquarters building for the society in Washington that would be named after its founder, Gifford Pinchot. Gifford, Jr.'s major interest was in oceanography. He said that the building was a great idea but he had recently provided a major gift in oceanography and fisheries biology. His interest and all of his spare funding at that time had gone into marine biology. He said that he couldn't do it and would not be able to participate. When he left I'd never seen anyone just more disappointed. Tom Gill sagged, and I thought maybe he was going to cry. He said, you know for many, many years I've thought of leaving most of my estate, he had no sons or daughters, to Yale University. He said it dawned on me about a year ago that I could make the greatest contribution to forestry by giving some $500,000 to the society for its own headquarters. As we sat there and talked I said, you know there's another way of getting matching funds. Why don't we see if the SAF membership would match your five hundred thousand (not from an individual, but from the membership). He just lit up, came alive again, "a tremendous idea," he said. He and I talked and we agreed to look at a million dollars as about what was needed to do what we were going to do right. With his five hundred thousand, if we had three hundred and fifty thousand from the membership, we could borrow a hundred to a hundred and fifty thousand and not overburden the society. He named several conditions. The first was that I would present the opportunity to the SAF Council and he would remain anonymous. He did not want them to have any knowledge that he was the anonymous donor. Secondly, he had hoped that the society would get a headquarters which would allow some of the other societies, similar societies, to locate with them. He wasn't specific but he said it might even, we might even be able to organize some kind of a consortium. Those were the three conditions that he wanted.

HKS: When did he die in all this?

RKA: Afterwards. Charlie Connaughton was asked to head the campaign and before they finished raising, it became obvious that we were going to do it. In fact they raised more than the three hundred and fifty thousand through pledges and gifts. It was at that time, just before the campaign ended that he died. Unbeknownst to me he had changed his will from Yale to the SAF. If the SAF accomplished its goal of raising $350,000, and if it could obtain the bank loan, then the $500,000 would go to SAF, otherwise it would go to Yale. That was how that came about. Then of course there was an excellent committee under the Forest Service deputy chief, Gordon Fox. Gordon Fox looked for sites. They found the Wildacres site, and all that's become history.

HKS: Talk a little bit more about Tom Gill, the person.

RKA: I didn't have a lot of contact with Tom Gill. We met probably once a month for lunch to discuss the International Union of Societies of Forestry.

HKS: So the tie with you, primarily, was international?

RKA: Yes, that was the complete tie. Tom was quiet and a little bit of a recluse, I think. He did attend some meetings. I only had three or four conversations with him about this affair. We pretty well settled it at that first meeting, and we talked by phone. I kept him apprised and I told him right off that he was going to have a hard time turning down requests for funding, for matching funds. It turned out right. Hardy and Charlie Connaughton and others just couldn't figure out why he wouldn't be one of the major contributors to the matching funds needed. Of course it didn't come out until later that he was the anonymous donor.

HKS: We have his diaries, we have some of his photo albums that show him in Honduras or wherever standing in front of big tropical trees. Was his interest in tropical forestry long lasting, I mean in later life other than he just was for it. He worked for the Pack Foundation? He did so many different things, I don't

know what kind of a forester he was, but was he really only active in tropical forestry during the '20s and '30s.

RKA: I am not sure. His international interests were principally in tropical forestry.

HKS: Okay. We have a photograph of him during World I as a fighter pilot with the white scarf, the whole business. He looked rather swashbuckling.

RKA: He wanted the practicing foresters to have more international ties, that was why he was behind this International Union of Societies of Foresters. He knew the work in IUFRO and was most pleased with it; that gave scientists a chance to exchange, but it was not for the practicing foresters. He thought that the counterpart of the SAF formed in a number of countries would help forestry.

HKS: Henry Clepper told me that Gill made his money through investments. That he played the stock market, or real estate or something, and it wasn't selling those novels and things that made him very much money. He was an astute investor.

RKA: He had a fair amount of property in the Washington area. I don't know any of the details.

HKS: If you bought property in Washington in the '20s, it's bound to have gone up in value.

RKA: I should say so. I didn't look upon Tom as a friend; he was a professional acquaintance, and I respected him and I guess he did me, but we did not talk about our personal lives or interests, except for this one goal of his.

HKS: I contributed something to Charlie's appeal. There were those who said it doesn't make sense to move the national headquarters out of downtown Washington, outside the beltway as it were, because if you're going to be effective you've got to have quick response time for requests from the Hill and attend all the social life in central Washington, D.C. Was that much of an issue? Was it difficult to pick an area as far out as Wildacres as opposed to trying to find something closer in.

RKA: That was an issue in developing the criteria for selection. There was some thought that headquarters might be in Richmond or someplace out of Washington. That was discarded fairly quickly just for the reasons you cited. But when it came down to Wildacres, the subway was planned to go there. It was appropriate to buy the Wildacres site. It was several years before there was a direct subway to almost anywhere in the city. That issue did not apply to Wildacres. It was easy to get from the airport to the headquarters and so forth. One of Gill's suggestions as I mentioned was that he would like to see the SAF be kind of a focal point for a larger grouping of natural resource related agencies. Out of that wish and with the property, the Renewable Natural Resources Foundation came about. It was formed at the instigation of the SAF. Hardy Glascock was very strong for it. In fact, the original Wildacres deed was deeded to the foundation and early on all of its support came from SAF personnel. At some point Hardy lost touch with realities. Even in Albuquerque, you may not remember but I remember giving quite a eulogy of Hardy Glascock in my president's report, how ethically strong he was and keyed into the nature of what professional forestry needed and so forth. Sometime after that he completely discarded forestry and SAF as an interest. He was the original leader of the Renewable Natural Resources Foundation. As a member of that council, and as president, we made a number of serious errors. Ben Meadows was the only negative person that I heard. Ben said this was poor business, we'll regret it. Ben was right. But other than Ben I think the council was completely in favor of the concept of the Renewable Natural Resources Foundation and its initial control over the site.

HKS: That was to serve primarily as a clearinghouse for funding that affected the whole area.

RKA: And to invite other people, through the foundation, it could build buildings and invite other agencies in wildlife...

HKS: So officially SAF was only one of the many organizations in the foundation.

RKA: It was formed with ten. SAF and I believe ten others, as I recall. Some of the others pledged some funding, I think the largest was thirty thousand dollars. We had authorized incidental use of SAF people on this. It turned up later that Washington office employees of the SAF were doing foundation work, much more than we anticipated. Some correspondence from other societies about RNRF were never brought before the council. And the council was not informed as to the degree of participation of SAF people.

HKS: This is Hardy's management we're talking about.

RKA: Yes, and we're talking about Hardy's management directly. There was a fund drive, and they asked Charlie Connaughton to head it up for industrial funding for a headquarters building for RNRF. At that time it became obvious that there were some problems. RNRF tried to evict us from Wildacres. We had Wildacres turned back to us through a deed transaction wherein we owned 90 percent and RNRF 10 percent. The reason for the 10 is that in Maryland that's the lowest percent of ownership that can have a say in management or direction.

HKS: By that time, though, Hardy was now director of the foundation.

RKA: Yes, I don't recall the dates that Hardy resigned from the SAF and became the director of the foundation, but shortly after that SAF was voted out. They met in a session and didn't invite John Barber who was then executive vice president of the society. When he arrived at the meeting he was informed that SAF was no longer a member. I'm not aware of what was said or done at that meeting.

HKS: I can see that Hardy may have had ill-will against SAF, but why would the other members of the foundation have voted yes? Can you speculate on that?

RKA: I think they were brainwashed and fed incorrect information.

HKS: Was Bill Towell your vice president? Because he was president during some of this turmoil. I interviewed him and he talked about it a little later in the process.

RKA: Bernie Orell was vice president. I think Hardy had to have had an aneurysm or something. He knew where the money came from, where the support came from. The entire operation was SAF, again leading back to Tom Gill's original suggestion. I don't like to be that negative about anyone, but it was unbelievably unethical. Deliberate misinformation was fed both to RNRF members and to SAF Council.

HKS: I knew Hardy very slightly when he was still in the trade association in Portland. When he was selected to be Henry Clepper's successor, I just happened to know Ed Heacox, who was on the SAF Council at that time. I asked him how you select somebody. He said Clepper ran his own show but the thing we know about Hardy is the council can control him. I'm not faulting Ed at all, I'm just saying it's interesting how things turned out.

RKA: Yes. I was on that same council with Ed when Hardy was employed. Henry ran things but you knew everything that he was doing. Henry could be dissuaded. It took a little argument and a few tears. He could come up with a good tear jerker, but Henry was certainly Mr. SAF for many, many years.

HKS: I want to keep this above the gossip level, but Henry left under some distress. Hardy left under some distress. Ron Christenson left under some distress. What is there about the SAF? I mean can you generalize about the position that makes it almost inevitable that you're going to run crossways with the council?

RKA: Let me talk about Christenson first. He left because he refused to work on RNRF. Hardy kept ordering him to do a lot of staff work for RNRF, Ron confided in me later. That was my first indication of misuse of SAF people.

HKS: I'd heard from a SAF council member that there's some confrontation and Ron said you know, I'm out of here, or something. I thought gee that's three that I know of.

RKA: I was on the council when Henry retired. It was just time for Henry to retire after his many productive years for the society.

HKS: Ron got in a kind of awkward situation because of the offer to Denny LeMaster who publicly announced he was going to be executive vice president. Then for family reasons he couldn't take it. Then they offered it to Christenson, so it wasn't the best way to get the job after all the publicity.

RKA: No, and Christenson was really not an administrator as such. He was an able person and he handled the accreditation of forestry schools in good fashion. I had worked with him a lot, but he isn't the one that I would have selected. Henry didn't want to leave, but I don't recall any direct confrontation.

HKS: It was time.

RKA: It was the time to do it and Henry was emotionally involved, but I don't recall any special incident.

HKS: The only ruckus that I remember (I was out in California then) was on the voting procedure in SAF. Henry supported that, and there was quite a battle against that. But since he ran the Journal, he always had the final say in all the letters to the editor. There was a lot of disgruntlement about that voting process.

RKA: Yes.

HKS: So I don't know if that was just one of many contributors to his retirement or not.

RKA: I think he'd always talked, as I recalled, for a number of years that he would be retiring at some time in the future. I remember the council meeting where he retired but I can't think of any one thing that caused that.

HKS: He and I got into a letter writing debate, when I was just a twerp in Portland, about who the first professional forester was. It was Gifford Pinchot, and no one before that counted. If you were so brash to write a letter to the *Journal of Forestry* saying that there were people before Pinchot, like Bernhard Fernow for an example, who really were superior to Pinchot's knowledge technically, you always got a rebuttal from Henry. He would print your letter, but he would shoot you down.

RKA: Is that right?

HKS: That's right. He was very sensitive on that particular issue. Of course he worked for Pinchot and admired him as a lot of...

RKA: Fernow was so obvious for quite a while. Now you've told me something that I wasn't aware of. In answer to your question, I don't think it's the nature of the job or the profession. It's like a coach of a football team. You've got nineteen thousand bosses in essence, and it's a very difficult job. There was one other controversial policy matter that took quite a bit of time. While I was president, in fact just before that, the Justice Department had taken off on several engineering societies, saying that there were canons in their code of ethics which, in effect, led to restraint of competition. The matter went to court through these societies. They were levied fairly heavy fines and paid court costs. We're talking about sizable sums of money. With that in mind, we found very similar canons in our codes of ethics.

HKS: Give me an example.

RKA: Such things as all professionals should be able to compete for consulting work by price level. Consulting foresters were in competition with foresters in State and Private Forestry and foresters paid by industry who had some latitude for doing consulting on the outside. They would underbid the consulting

foresters because they were financed partially in some other way. The consulting foresters were very unhappy with any changes in the code, which would give more freedom to industry and State and Private Forestry.

HKS: We face that all the time. We're constantly underbid by professors who receive support from the university to do history projects. We just can't compete at all. So that's the issue you're talking about.

RKA: That was one of the issues. I can't remember the details. They asked me and I wrote a long article for their bulletins to use and we didn't put their material in the Journal. It caused a lot of hard feelings, principally because we had no choice as far as I could see. The council backed me on it. We had no choice but to make the changes dictated by the Justice Department.

HKS: I would think that's the way life is. Were you ever involved in a code of conduct violation where a forester was charged?

RKA: Yes, there were one or two cases like that, I don't recall them but the council appoints a committee to review the matter and makes a recommendation to the council.

HKS: I can't remember who I was talking to at SAF, but he had a recent case where a forester, through some process, had become a convicted felon and was in jail but he hadn't violated the code of conduct. They thought there was something missing in the code of conduct, if you could be a gangster and still be a good honorable forester, that there was...

RKA: You've probably noticed I had a remarkable faculty for picking up things in a hurry and forgetting them just as fast. The division directors in Washington, D.C. said they could make me an instant expert in almost anything. I could take information and digest it and so forth and appear before committees or do whatever was necessary, but three days later I couldn't tell you what it was about. The same weakness applies in some of the things we've been talking about. I hadn't remembered reviewing your book, for example, and when you mentioned it I remembered the book, but I still didn't remember even yesterday that you had written it. I don't mean that I hadn't paid attention to you but it's the nature of how my mind has worked for many years. That's why I am vague about some matters we have discussed; I'm not trying to get out of talking about them. Right now I wish I had kept a diary.

HKS: There was a canon that's always bothered me. As a matter of fact it may have been during this very time when the code was revised and put up for vote as a member. And I voted no. And when the results were published in the Journal, the changes were adopted overwhelmingly, I think the vote was like nineteen hundred and forty-two "yes," three "no" votes. I mean it was on that scale. I was one of three weirdos out there. The reason I voted no is that one of the canons is loyalty to the employer. To me loyalty to the profession should have been higher than that, to be idealistic in the sense of a code of conduct. In the real world we waffle on certain things, but in terms of what we aspire to, that's always troubled me. Do you recall off hand, was that canon debated much?

RKA: Yes, that canon was debated in the council a great deal. It was a difficult thing. I remember that at one time we said that foresters should try to influence the policy of their employer, the landowner, or whatever. The forester didn't have to take the position that the landowner did. But once the landowner decided what he wanted to do with his property, the forester should do it in the best professional way. That's where I remember that one coming out. But it was a matter of what the landowner wanted to do and how it was done. The forester should put his profession first in trying to help the landowner decide what to do, but once he did it, then the professional had to do the best job he could for the landowner.

HKS: How important is a code of conduct? I realize every organization has one, but I'm not sure how often each working day a field forester thinks about that. Do you think it has much influence on the way people behave?

RKA: I doubt it. Yet every profession needs a code. There's much to do over any change in the canons. But I doubt if anyone often considers ethics before he or she decides to do something or not do something.

HKS: Clyde Walker must have been at Berkeley when you were there. I got to know Clyde very well when I was active in SAF. I asked him about the code of conduct, because we have all the SAF records at the Forest History Society. Clyde said the only case he knew about was when the northern California chapter wanted to put Gordon Robinson, the Sierra Club forester, up for violation of code of conduct. He said all they ever determined was that he was a striped-assed son of a bitch, but that wasn't unethical. [laughter] I know a lot of people were disappointed by Gordon's abrasiveness, I guess one could characterize it.

RKA: He was in my graduating class at Cal. He was among the poorer students and had particular difficulty at summer camp.

HKS: I was going to ask when you said '37, I interviewed Gordon years ago so I knew he was about your time. He was certainly pugnacious, I guess maybe that fit the hard hitting tactics of the club, to have an aggressive spokesperson.

Retirement

RKA: Yes, I think that was right. We're getting down to my retirement from the university.

HKS: Alright.

RKA: I was ready for retirement from the University of Texas by 1980, and at that time my university retirement systems came in. With eight years in Washington, D.C., and the teaching in the LBJ school, I had a good handle on forest policies. It occurred to me I might keep in touch with deans of forestry to see if they had any openings for sabbatical leaves or some position to fill temporarily; I'd be glad to teach a class in forest policy or policy seminars. It worked out quite well. Colorado State University was first, and I spent a semester up there thoroughly enjoying it. I looked kind of for parts of the country where I wanted to live for awhile. I hadn't spent a lot of time in Colorado so that was enjoyable. I went to Oregon State with Carl Stoltenburg for another semester. And the University of Maine after that. But then meanwhile we had moved from Austin to Hots Springs Village, where we are now, living in the middle of an oak-pine forest on the lake. The University of Arkansas, Monticello, which is south of here, needed someone to teach forest policy. They could not fill a full-time tenured appointment right away. So I taught one semester for three years. I was there when the University of Arkansas Forestry School got accredited.

HKS: You'd go down for the week and come home on weekends?

RKA: I taught a three hour course, three lectures, and I gave lectures Monday, Tuesday and Wednesday.

HKS: I see, accommodation for your travels.

RKA: I went down Monday morning and came back Wednesday afternoon.

HKS: Without getting too personal, is the compensation equivalent to the actual performance. Is this really a bargain for the school to get someone like you?

RKA: It was a bargain. I had my travel and living expenses covered and a little more. I wasn't in it for the money. But I didn't take a full professor's pay at any of them. In fact, in Maine Dean Fred Knight just covered my travel and living expenses. They had funds for that sort of thing. Kind of interesting, a couple of years later John McGuire did the same thing and they paid him an honorarium along with it. Fred explained to me they had more money available when John was there than when I was there.

HKS: I know Fred a little bit.

RKA: Fred was at Michigan, chairman of the department of forestry, when I was there. Just after I left he went to Maine as dean. Fred was an excellent professional, top grade forester and entomologist. Maybe we ought to summarize two or three things here. Conclusion

HKS: That's fine. The standard question is any regrets, what part are you most proud of.

RKA: I think in terms of the deputy chief position, that I probably was an average deputy chief. There was a lot of momentum going when I arrived, and I really was a little bit ill prepared for the job. I had relatively few congressional contacts, even in California it was done by other people there for the station. I enjoyed it thoroughly, and I don't have any regrets. I kept the thing going and supervised moderate growth, and particularly with Dickerman's very valuable work, we solved all problems. But I don't think things grew so rapidly as with Harper or Jemison. I did do a lot toward moving in environmental issues. I think my forestry career just happened. You've asked several questions was I thinking about this job or that. From the standpoint of the division chief in fire in California, I think I could have stayed in that position the rest of my working life and thoroughly enjoyed it. I felt that about every position. I had never intended to leave Michigan. In fact, there was informal discussion that maybe I ought to look at the vice president for research job there sometime in the future, particularly when I left. I never had a career plan, but I certainly was in the right place at the right time many times. I used the GI bill to work on a Ph.D. at Michigan. The Armed Forces Special Weapons Project gave me good experience in research administration. I learned a lot of what was good and what was bad from watching people. I would not have been the station director in Berkeley if it hadn't been for the fact that they needed someone in a big hurry. And Harper, I don't how he picked me except that Sam Dana had told him about me. The chance meeting with Steve Spurr made it possible to go back to Michigan, and then, of course, Freeman and McNamara made it possible for me to return as deputy chief.

HKS: Seems like you get a couple of your jobs because they're in a hurry. I'm not trying to say that you weren't really qualified but they needed somebody at the moment. You were qualified so, and available, and...

RKA: That's why I say that somebody had to have a plan, and I do believe in a higher authority than all of us. It just seems to me that there was a plan, but I wasn't knowledgeable on it until after it was over. But that takes care of anything I have. I don't know about whether you have any questions.

HKS: I think it's an excellent interview. You were certainly well prepared.