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Water Resources People and Issues

Interview with Theodore M. Schad

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Theodore M. Schad

Interviewed by
Martin Reuss

Office of History
and
Institute for Water Resources
U.S. Army Corps of Engineers
Alexandria, Virginia

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Preface

Among the leaders in federal water resources planning in the decades following World War II, few have exerted more influence than Theodore Schad. He began his career with the Corps of Engineers and the Bureau of Reclamation. Later, Schad joined the Bureau of the Budget and the Library of Congress Legislative Reference Service. As staff director to the U. S. Senate Select Committee on National Water Resources (1959-61) and as executive director of the seven-member National Water Commission (1968–73), he ensured that analyses of water problems fully exploited the insights and skills of engineers and natural, social, and physical scientists, while remaining sensitive to political and administrative realities. In the 1970s, he continued to serve the water community in a number of positions with the National Academy of Sciences, the Conservation Foundation, and the National Groundwater Policy Forum.

This interview is the fourth published in the Water Resources People and Issues: Hydraulics and Hydrology series. However, it is the first of the series to enjoy the support of the Corps of Engineers Institute for Water Resources, which funded and helped coordinate its publication. Through in-depth interviews, this series presents the thoughts and careers of key individuals who have influenced United States water resources development. I commend this interview to all those interested in the past and future of water resources planning.

ALBERT J. GENETTI, JR.
Major General, USA
Deputy Commander

Interviewer

Martin Reuss is a senior historian in the Office of History, Headquarters, U.S. Army Corps of Engineers. He specializes in the history of flood control, navigation, and civil engineering. Among his monographs are *Shaping Environmental Awareness: The United States Army Corps of Engineers Environmental Advisory Board*, 19704980, *Reshaping National Water Politics: The Emergence of the Water Resources Development Act of* 1986, and *Designing the Bayous: The Control of Water in the Atchafalaya Basin, 1800-1995.*

He also introduced and edited *Water Resources Administration in the United States: Policy, Practice, and Emerging Issues* and coedited *The Flood Control Challenge: Past, Present, and Future.*

Numerous professional journals, including The *Public Historian, Technology and Culture, Environment, The Journal of Policy History, Central European History, Louisiana History,* and *South Atlantic Quarterly* have published articles by Dr. Reuss.

He received his Ph.D. from Duke University and taught at Georgia Southern College, Virginia Polytechnic Institute and State University, and the University of California, Santa Barbara.

Acknowledgments

Marilyn Hunter, Office of History, and Arlene Nurthen, Institute for Water Resources, U.S. Army Corps of Engineers, provided editorial and technical support. Barbara Barnes prepared the index.

Contents

Photographs

Introduction

Theodore M. Schad has over 50 years of experience in natural resources engineering and policy. Born August 25, 1918, in Baltimore, Maryland, to William Henry and Emma Margaret (Scheldt) Schad, he received his Bachelor of Engineering (Civil) degree from Johns Hopkins University in 1939. His first work was in the summer of 1937 and 1938 on rural electrification projects in southern Maryland and the northern neck of Virginia. After graduation, Schad worked for a year for the Baltimore District, U.S. Army Corps of Engineers.

In 1940, Schad went to work for the Bureau of Reclamation, Department of the Interior. He worked about one year in the Spillway Design Section in the Office of the Chief Engineer, Denver, and then in project investigations in the Pacific Northwest. In 1942, Schad rejoined the Corps of Engineers, serving in the Seattle District, first in the Specifications Section and then as rivers and harbors reports coordinator in the Engineering Division.

In 1946, Schad moved to the Office of the Commissioner, Bureau of Reclamation, in Washington, D.C. There he served successively as staff engineer, chief of the Coordination of Plans Section, and assistant chief of the Program Coordination Division, with responsibilities connected with authorizing projects and coordinating the work of the Bureau with other agencies.

Schad left the Bureau of Reclamation in 1954 and moved to the Bureau of the Budget (now the Office of Management and Budget), Executive Office of the President. He initially served as a budget examiner for the civil functions of the Corps of Engineers. After a reorganization of the bureau in 1956, he became the principal budget examiner for all of the water resources programs of the federal government, including those of the Corps of Engineers, Bureau of Reclamation, Panama Canal Company, Saint Lawrence Seaway Development Corporation, and Tennessee Valley Authority.

In 1958, Schad moved to the Legislative Reference Service of the Library of Congress where he served as the senior specialist on engineering and public works. Though mostly focused on water resources, Schad also occasionally worked on assignments in military public works, highways, and space. Later, in 1965, he

served as the deputy director of the Legislative Research Service in the Library of Congress.

Schad served as the staff director to the U.S. Senate Select Committee on National Water Resources from **1959** to 1961, producing a report which led to the enactment of the Water Resources Research Act of 1964 and the Water Resources Planning Act of 1965.

In 1968, Schad was named the executive director of the National Water Commission, an independent, seven-member study commission created by Congress to prepare policy recommendations to the President and the Congress on all aspects of water resources policy. The commission's final report, *Water Policies for the Future,* was transmitted to the President and the Congress on June 14, 1973. Many of its recommendations were subsequently implemented to varying degrees.

Schad became deputy executive director of the Commission on Natural Resources, National Academy of Sciences, sharing responsibilities with the executive director for development and administration of academy programs in the fields of agriculture and renewable resources, environmental studies, mineral and energy resources, and radioactive waste management. During this period he served also as executive secretary of the Environmental Studies Board (1973 to 1977) and as the principal staff officer for committees on Water Quality Policy (1973 to 1976) and Water Resources Research (1979 to 198 1).

In 1982, Schad became the principal staff member for water resources on the Commission on Physical Sciences, Mathematics, and Resources at the National Academy of Sciences. He became involved in creating and developing the program of the Water Science and Technology Board in the National Research Council.

From 1984 to 1986, Schad was senior fellow of the Conservation Foundation and executive director of the National Groundwater Policy Forum.

Schad retired in 1986 but continued work as a consultant.

From 1986 to 1987, he served as a consultant to Ronco Consulting Corporation on the United States Agency for International Development studies for the Gambia River Basin Development Commission. He prepared a report on the development

of a planning capability for the basin and then the water resources chapters of the summary report on the project.

In 1990 he served as a consultant to the Ford Foundation's Western Water Policy Project at the Natural Resources Law Center of the University of Colorado Law School.

Schad also served as a consultant to the Office of Technology Assessment, United States Congress, on the water resources chapter of the October 1993 report, *Preparing for an Uncertain Climate*, including an analysis of proposals for a new commission to study U.S. water policy.

Career Summary

1939 to 1940
Corps of Engineers, Baltimore District, Maryland

1940 to 1942
Bureau of Reclamation, Department of the Interior, Denver, Colorado, and Pendleton, Oregon

1942 to 1946
Corps of Engineers, Seattle District, Seattle, Washington

1946 to 1954
Office of the Commissioner, Bureau of Reclamation, Department of the Interior, Washington, D.C.

1954 to 1958
Budget Examiner, Water Resources, Bureau of the Budget (now the Office of Management and Budget), Washington, D. **C.**

1958 to 1968
Senior Specialist, Engineering and Public Works, Legislative Reference Service, Library of Congress, Washington, D. C.

1959 to **1961**
Staff Director, U.S. Senate Select Committee on National Water Resources, Washington, D.C.

1961 to 1966
Senior Specialist, Engineering and Public Works, Legislative Reference Service, Library of Congress, Washington, D.C.

1966 **to** 1968
Deputy Director, Legislative Reference Service (now the Congressional Research Service), Library of Congress, Washington, D. C.

1968 to 1973
Executive Director, National Water Commission, Washington, D.C.

1973 to 1983
Deputy Executive Director, Commission on Natural Resources, National Academy of Sciences, Washington, D.C. (1973 to 1982) with concurrent service as Executive Secretary, Environment Studies Board (1973 to 1977)

1982 to 1983
Staff Officer, Water Science and Technology Board, National Academy of Sciences, Washington, D.C.

1984 to 1986
Senior Fellow, Conservation Foundation, and Executive Director, National Groundwater Policy Forum, Washington, D. C.

Personal

Parents: William Henry and Emma Margaret (Scheldt) Schad
Marriages:
Kathleen White, married November 5, 1944
Margot Cornwell, married March, 1995
Children:
Mary Jane S. Klingelhofer
Rebecca Christina Schad

Education

1936 to 1939: Bachelor of Engineering (Civil), Johns Hopkins University
1939 to 1940: Graduate work in hydrology at Johns Hopkins University

Honors and Awards

Meritorious Service Award, U.S. Department of the Interior, 1950
Honorary Member, American Water Works Association, 1970
Iben Award, American Water Resources Association, 1978

Caulfield Medal, American Water Resources Association, 1990
Fellow, American Society of Civil Engineers and President, National Capital Section, 1967 to 1968
Julian Hinds Prize, 1991
Fellow, National Speleological Society, Certificate of Merit, 1968
Woodrow Wilson Award for Distinguished Government Service, Johns Hopkins University, 1997

Publications

Theodore Schad is the author of many government reports, primarily in the field of water policy, and articles in journals of the American Society of Civil Engineers, American Geophysical Union, American Water Resources Association, Western Resources Conferences, and others. From 1964 to 1968 he wrote articles on water resources and conservation for the *Encyclopedia Britannica Book of the Year*.

Memberships

American Academy of Environmental Engineers
American Association for the Advancement of Science
American Geophysical Union
American Institute of Hydrology
American Society of Civil Engineers
American Water Resources Association
American Water Works Association
International Commission on Irrigation and Drainage
National Academy of Public Administration
National Speleological Foundation
Trustee, National Speleological Foundation
Permanent International Association of Navigation Congresses
U.S. Committee on Large Dams

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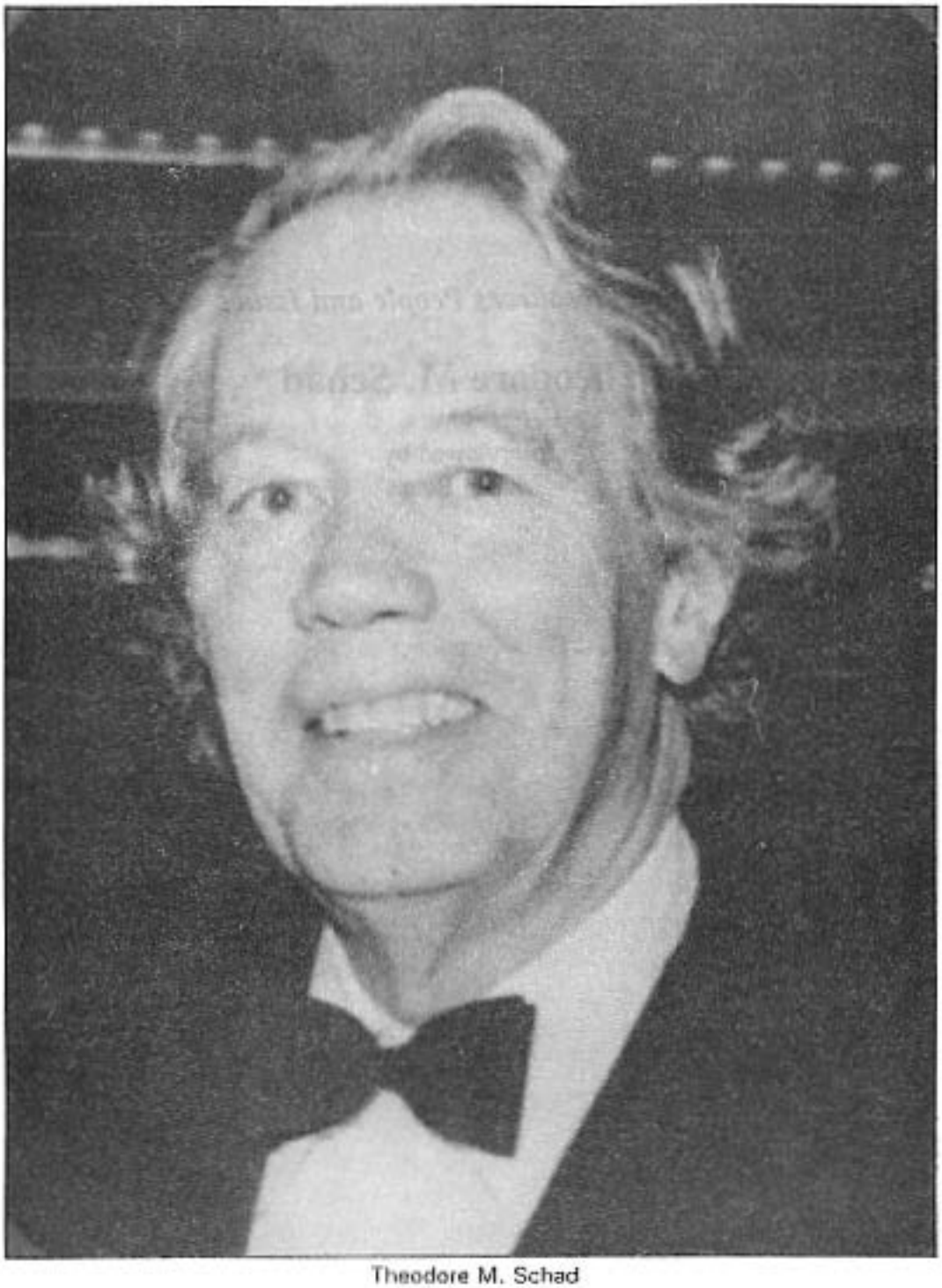


Theodore M. Schad

Interview with
Theodore M. Schad

Early Years

Q: Ted, let's begin by talking about your family and your upbringing, the schools you went to as a boy. Tell me about your parents, for one thing. What did your father do, where did your parents come from?

A: Well, I can do you one better than that. My grandfather was born in Hesse-Darmstadt in Germany in 1841. His grandfather had been a Hessian soldier in the service of King George III in the Revolutionary War. We don't know anything about his service, but I have been told that he came back to Germany full of stories about what a wonderful place America was, that it was a great place to live.

His grandson, my grandfather, Henry J. Schad-they pronounced it in Germany, although it is spelled S-c-h-a-d-was sent over, or was allowed to come over, to the United States when he was a teenager. His mother did not want him to be conscripted into the Hessian Army because this was before Bismarck and the Hessians were still putting out mercenaries anywhere in the world that would pay for them. So he came over as a teenager to avoid being conscripted in the Hessian Army.

That was in the 1850s, and before he got the chance to marry or do anything, he was drafted into the Union Army in what we, of course, call the Civil War and the Southerners would call the War of Northern Aggression. He lived in Baltimore. Baltimore really had Southern leanings and the first little skirmish, outside of Fort Sumter, was when the Massachusetts militia marched from one station to another in Baltimore and they were stoned by the populace.

This manuscript is an edited version of an oral history interview conducted by Dr. Martin A. Reuss in Arlington, Virginia, on February 27 and 28, 1989. The original tapes and unedited transcript are in the Research Collections, Office of History, Headquarters, U.S. Army Corps of Engineers, Alexandria, Virginia.

But he was drafted into the Union Army, and he served with great pride and has been quoted as saying he thought that to serve one's country in time of war was one of the finest things a person could do. He ended up as a master sergeant after the second re-enlistment. I've never had the time to check up and find out what battles he was in, but I have seen a little write-up about him in which he expressed his pride in his military service. Of course, a lot of what I know about him is what my father told me.

My grandfather was very proud of being an American. He married a German girl, a German woman, whose name was Emma Augusta Yeager, and she also had been born in Germany. I don't know much about her. They had a large family. They lived on Fremont Avenue in west Baltimore after the war, where he set up shop as a shoemaker.

My father was one of the latest of the family. There were seven children, two girls and five boys, and my father was number six of this lineup, born in 1876, and his name was William Henry. Interestingly enough, they didn't speak German at all. When my sister and I studied German in college, my father could not help a bit. He told us how his mother and father spoke German-that was their native tongue-but when the children would speak German his father, my grandfather, would say, "This is an American household. We speak English in this household." My grandfather was very, very patriotic-having been in the service in the war. Anyway, that was the beginning of my branch of the Schad family in America.

Some of the Schad children went to college, but my father wanted to get out on his own, and he did, at a very early age-his first job, he told me, was making wheels for wagons. I still have the spoke-shave that he used. He used to tell about how difficult it was to make these wooden wheels and then to heat up the steel rims and get them on it so they would fit tightly after they cooled without burning the wood.

And he was able to do everything with his hands. He did enlist-he was very proud of enlisting-in the Spanish-American War, and he used to tell me many times that it was the only war in which all the American troops were volunteers. No drafting. Because this was many years after the Civil War, Civil War history seemed very romantic-people talked about it, and particularly his father who was still living and thought that it was a great patriotic duty to serve one's country as a soldier. My father never got to Cuba. He got as far as

Tampa and he got the typhoid fever and it bothered his health for years afterwards.

He took a job as a motorman on an open-platform street car in Baltimore, but the cold weather almost killed him. After that he went into various businesses. Not having had the benefit of a college education, he took up what now seems to be a very unusual occupation for a man. He was a shirt ironer. This was in the day when men wore high collars, separate collars, and, of course, the shirts and collars were heavily starched and had to be ironed. He traveled up and down the East Coast. Anybody who was a good shirt ironer could get a job anywhere. He was working in laundries, and this is something that went out of style, I guess, in the first decade of the century. For a while, he operated his own laundry; he and one of his brothers operated a laundry in Washington.

He was living in Kingston, New York, when he and my mother courted. My mother was a Baltimorean-all of my family history is based in Baltimore except my father traveled around a lot. My mother was born in east Baltimore and lived there until she married. My father courted her from Kingston by postcard, and I still have somewhere in my archives upstairs the postcards that they wrote back and forth from Baltimore to Kingston, New York, where he was employed as a shirt ironer in the laundry.

They courted that way for a year or two. They had met while my mother was visiting a cousin who lived in Kingston. Eventually, he came down to Baltimore and married my mother, whose name was Emma Margaret Scheldt, also of German extraction. But the Scheldt side of the family came from north Germany.

Q: Was that S-c-h-e-l-d-t?

A: Yes, the same as the river which the Dutch call the Skelt, and you could say "S-c-h" could be pronounced in the same way, like "school." But it wasn't.

My grandmother was born in this country, but her parents were from Germany, from Schleswig-Holstein, and they actually spoke a different kind of German. The German was so different in the north and the south, but understandable.

Anyway, my mother and father were married on June 12, 1907, and lived in Kingston, New York, for a few years. My father was a pioneer in

photography. He took pictures up and down the Hudson River valley and in the Catskills around Kingston. This was in the first years when they started to have film on celluloid rather than glass, although he even had some pictures that were on glass. It was a hobby that he had in those early years and then he just stopped it, apparently, when he moved back to Baltimore because I don't have any pictures that he took after they came back to Baltimore, probably in about 1910, or possibly when my grandfather died in 1911.

And-I tend to be a little bit emotional in all this. I mean, you know, it—

Q: Sure.

A: But anyway-I'm probably telling you more than you want to hear, but you can cut it out later.

The laundry he ran was in Washington, but he was living in Baltimore-this would have been before World War I. I think World War I is what killed the high white collars. Now, Herbert Hoover, you remember, still wore them when he was President. You may not remember, but I remember the pictures of him with those high collars, and they were so tight that the necktie wouldn't even get up in them sometimes.

Shortly after the beginning of the First World War, about 1914, my father started to work for the British government in procurement of war materiel, and he worked for them all through the war and eventually got a citation from King George V. Somehow this British service seems to run in the family. I just realized that my great great grandfather served King George III as a Hessian mercenary in the revolution, three generations earlier. Somewhere we have this citation that my father got for having helped the British war effort. You remember, the United States didn't get in the war until much later.

Having served in the Spanish-American War, my father was free from World War I service. In the meantime, my brother had been born in 1908 and my sister in 1915. I was born August 25, 19 18. We were living at 601 North Calhoun Street, Baltimore, Maryland, at the time. After the war, my father went into various businesses, largely involved in buying and selling materials of all kinds.

They also took a step which had quite an influence on my life. They bought a farm out in Baltimore County about 20 miles northwest of Baltimore-actually, the farm overlapped across the northwest branch of the Patapsco Falls-that is what they call it-and over into Carroll County. So it was right on the county line there, near the little town of Reisterstown.

And they really thought they would go out there and make a living on a 169-acre farm. But the fallacy in that can be demonstrated by my mother's talking about how they had looked for farms up and down the countryside of Maryland, Anne Arundel County waterfront and everywhere, and she said, "When we drove over the top of the hill and we saw that farm spread out below us in the valley of the Patapsco Falls, we knew that was the place for us."

Well, the fact that it was such a lovely, idyllic setting, with wooded hills and rolling country made it not a very good farm. Terrible erosion-they didn't know about contour plowing in those days. Of course, my early recollections are of living on the farm, and I remember the way those fields would erode. They planted corn and wheat and had horses and cows and chickens-it was just going to be a general purpose farm.

My father built a tenant house and hired a man to run the farm. The man's name was Solly. I don't know where they got him, but he had grandiose ideas of riding around on a horse and telling the hired hands what to do. Of course, you don't do that on a 169-acre farm.

And the origin of the 1929 crash was in the agricultural depressions in the early years of the '20s. I don't know just which year they found out their dream of making a living on the farm wasn't going to work, but by 1923 my father had gone back to work in the city. He was commuting back and forth to Baltimore, driving a big Reo touring car.

Q: Photography, or—

A: No. He was working in real estate. I'm not sure when he started to work for Randall H. Hagner and Company, where he was involved largely in apartment house maintenance, but that was what his work was most of the time when I was growing up.

We didn't have a telephone on that farm and I'll never forget the time-this is one of my very early recollections-when Father didn't come home-we always called him "Father." None of this "Daddy" stuff or "Pop." It was "Father."

He didn't come home. We didn't know what had happened, and it was maybe two days before my mother got a letter from an aunt saying that he had appendicitis and was in the hospital and operated on and was all right. It was an emergency appendectomy, but we didn't have a telephone on the farm, so we didn't know what had happened. We didn't have a telephone until sometime later.

Anyway, in 1925 things got so bad that we had an auction of the farm equipment and moved into town so the commuting wouldn't be so hard. My father sold the farm to a family that wanted to move out there to give their children more space to grow up. The farm had been financed with a Federal Farm Loan Board mortgage, the nature of which was that my father was responsible for that mortgage no matter what, so when he sold it, taking back a second mortgage, he was still responsible. After selling the farm we moved into the town of Reisterstown to a house that my father rented at 360 Main Street. At that time, I was in the first grade. Later on, when I was in the second grade, we moved to a house on a one acre lot at 22 Woodley Avenue in Reisterstown. That's where we lived through the rest of my childhood, all the way through high school for me.

One of the things I haven't mentioned yet happened in 1920; I was stricken with polio which hit my right leg and damaged the muscles in the lower leg, particularly in the foot. I had to wear a brace on my lower leg until I was six years old. There are a lot of pictures of me with the brace and all, and I never looked very happy. I don't know whether I should say this or not, but my mother kept me with long curls until I was six years old. I had light blond hair and many years later she always said, "My, you wet your hair too much. It's getting dark."

And they always called me "Mac" because I had a cousin whose name was Theodore-Theodore G. Schad that they called "Teddy"-and my mother didn't want me to be called "Little Teddy" because the family already had Aunt Emma and Little Emma, and Uncle Harry and Little Harry, and my mother didn't like that. My middle name was Mac Neeve and so they called me Mac, and I went all the way through high school under the name of Mac and that's

how we got away from the pronunciation of Schad with a broad "A." You can't say "Mac Schad," with a broad "A." (Laughter)

And my father often said, "I don't care what they call me as long as they call me when it's time to eat." He was a little irreverent, I guess, on some things, but most of the time the other branches of the family pronounced the name Schad with a broad "A."

Well, anyway, at age six, the doctors decided that they could operate on my leg and do a muscle transplant which would help me to walk without a brace. A wonderful doctor, Dr. Howard Bennett, did the operation. It was done at Children's Hospital, which was on Green Spring Avenue, near Cold Spring Lane in north Baltimore.

So when I was six they cut off my curls and took me to the hospital and I had the first operation, which was a muscle transplant, just before entering school in the first grade. I didn't go to school much during the winter while we lived on the farm, but when we did go to school, I remember walking up the driveway to the road and riding to school in a Ford panel truck without any windows, with benches in the back which a gentleman named Mr. Fitz, pronounced "Fights" used to drive as a school bus. He would pick up about a dozen children who were crammed into this little Ford panel truck. After we moved into town in March 1925, I could start to go to school regularly, and I think out of the 180-day school term, I think I went to school 95 or so days and was absent the rest of the time.

But I had learned how to read-our house was full of books, and my sister read to me, and I almost progressed along with her. She was three years ahead of me, and so I could read, and I didn't have any trouble with school at any time because of that.

The people that bought the farm defaulted on the second mortgage; my father had to take the farm back, and we had that farm around our necks almost like a millstone all through the rest of the '20s and the '30s. My father was working in Baltimore, and we'd get various tenants on the farm. He sold the farm again to a gentleman who was going to raise beef cattle; the farm was perfectly suited to that. Again, he had to take a second mortgage. Nobody had money. This probably was around 1929 or 1930.

And when the second payment on the second mortgage came due-every six months there was a payment due-the man came in and said to my father, "Mr. Schad, I'm sorry, I can't make that payment now, but I've got a barrel of whiskey here. I'll give you that on account, and as soon as I sell a few head of cattle, I'll give you the rest of the money." I think the payment was $500 every six months.

Well, a little while later we heard that the still that he was operating in the barn had been blown, the explosion knocked the whole side out of the barn, and he disappeared and we never heard of him again. He apparently was running the cattle as a front for a still. This, you remember, was during Prohibition.

So we had the farm back and we'd plant beans one year and we'd plant peas the next year for the cannery. Some years they'd say, "Well, we can't take them. Just plow them up." Other years, we would pick the beans. That's about as hard work as I've ever done-stoop labor, picking beans for the cannery. We liked it when they planted peas because they were harvested mechanically, vines and all.

Anyway, the farm never really was profitable and finally, in 1940—this was after I had graduated from college and had gone out West-it was taken by the city of Baltimore as part of the Patapsco Reservoir area. The upper end of that reservoir floods into our farm and has drowned out some of my first recollections about water, which go back to playing in the stream, playing in Keyser Run before I was six years old.

Q: I wanted to ask you, as a matter of fact, if I could interrupt, whether you think your early experiences on the farm -which you obviously remember rather vividly-may have influenced your career and what you finally went into. **Do you** have any feelings about that?

A: Yes, I think it did in two ways. One was that my earliest recollections are playing in that stream and climbing up on a big rock. There was a big rock there that must have been all of six feet high, like a boulder, and it kind of sloped into the hillside, so you could walk around the back and get up on top of it. And I think this is my earliest recollection-being up on that rock, and my grandmother, who took care of me most of the time while my mother was off doing other things and running the farm, grabbed me so I wouldn't fall. I must have thought it was great fun to get up on that rock. So I did it again and

she brought me down again and smacked my hands and I think that's why I remember it.

It must have been the summer when I was either four or five years old. But that incident brought rocks and water together both of which have been a very significant part of my life from then on, although it took a little while before it all came together that way because I got off into other interests.

Q: Sure. You went to school, then, in—

A: Franklin High School in Reisterstown. I started there in the first grade and I went all the way through that school. When I started in the first grade, the whole class was all in one room. That year my brother was a senior in high school upstairs, my sister was in the fourth grade, and I was in the first grade. That was the one year the three of us were there in school together, the year of 1924-2s.

When I was in the sixth grade they built a new high school, and my seventh grade moved over into the high school building when a number of other schools were consolidated with Franklin. This, remember, was rural Maryland and we had no junior high. We had seven grades and then we went into high school and had four years of high school. So I got through school in 11 years, whereas in Baltimore and in many other places, people were generally going 12 years. And this eventually got me through college when I was only 20.

Going to the same school for 11 years gives me very vivid memories. I could probably-and I know you won't be interested, but I could probably tell you the names of all my grade school teachers and quite a few of my high school teachers. Of course, one reason is that, from time to time, I've been back there. We had our 50th high school reunion in 1985.

Q: How many people were in that class then?

A: Well, there were not a lot. There were about 80 that graduated in 1935 and there were about 70 surviving in 1985. About 45 or 48 or so and their spouses were there in 1985 for the reunion. We also had a 20-year reunion and there may have been other reunions. Those are the only one that I attended.

Q: Well, let me ask you this. When you were in high school, in particular, did you early develop an interest in science and mathematics and things of this sort, or—

A: Yes. I was always good in science and mathematics. I remember when I took geometry once arguing with the teacher and proving that she was wrong in something she had put on the board, One of my friends said, "Mac, she's going to flunk you." Instead, she gave me an A.

Q: Good for her.

A: I loved chemistry and physics, but strangely enough, the thing that obsessed me at that particular time was maps. My grandfather had bought a lot of atlases which had beautiful maps-these would be engraved maps that were so carefully printed that they were works of art-back in the 1870s, 1880s. My family was the repository for many of my grandfather's possessions. Having lived on the farm and living in a huge old house in Reisterstown, we had lots of space. So many of the relics from my grandfather came down to my father, including the shoemaker's tools. I still have some of those lasts that, I'm sure, were my grandfather's. My father kept them all; we kept everything.

But I was obsessed with maps. I became a Boy Scout. I mapped everything in sight using a compass and pacing techniques that were required for the First Class Scout test. I was really obsessed with maps, and the reason I mention this is it had quite a bearing on something that happened much later in my life.

Johns Hopkins University

Q: When you decided to go to college, did you have any difficulty making a choice?

A: Well, that's where the maps came in. I knew I wanted to be a civil engineer, largely because I wanted to make maps, but it was kind of a romantic vision of civil engineering, of a man out there squinting through a telescope with riding britches and-that's the way surveyors used to dress in those days-and so when I applied at Johns Hopkins, I listed civil engineering as my major. I'm sure that's the reason.

Now, remember, you apply when you're in high school-your senior year, I guess. Maybe in the fall of senior year. But that's what I put down. I also applied at Princeton and MIT [Massachusetts Institute of Technology] and considered colleges that didn't teach engineering, but I really wanted to take engineering. Those were the three that accepted me, but our family was not financially able to pay my tuition—there wasn't enough money for me-my sister was already in college. She was going to Western Maryland College, commuting from home-Western Maryland College is in Westminster, about 12 miles from Reisterstown. So it was a question of my getting a scholarship or not going. We were land poor, with that farm. Half the time we didn't even make expenses on it. I can't say that we were all that bad off, because my father had bought other properties and was renting them. These were properties that were in need of rehabilitation. He would buy a property that didn't have a water supply-didn't have indoor plumbing. It would have a well on the back porch and he would put in a pump and a water system, upgrade the house and rent it.

But this was during the '30s, you see. I graduated from high school in 1935 and a lot of those people didn't pay the rent, and my father was too good natured to put them out, so we never had much money. And it was a question of a scholarship or I wouldn't have been able to go to college.

Fortunately, Hopkins had a lot of scholarships through the state scholarship system in the engineering school, and I took that exam. I had also applied for and got a small scholarship at Princeton, but it would not have been enough. To live in Princeton would have been expensive, so I just reluctantly-since Princeton was my first choice-gave it up. But I had done very well on the scholarship examination for Hopkins. I never really considered MIT very seriously, although I was accepted. In those days, they didn't use the Scholastic Aptitude Test. They used the College Entrance Examination Board exams, which were held on the campus at Johns Hopkins and were largely essay-type questions.

And so I was accepted, but my recollection was that I didn't do particularly well in the science part of the CEEB exam. MIT sent me the grades. Apparently I had actually flunked the science exam, but I had done well enough in all of the others that they accepted me.

Later, there was an examination at Hopkins for Maryland state scholarships which were under the control of the state senators. Although I placed high enough on the exam to earn a full scholarship, when the time came, I didn't get the scholarship that I had earned, but I had good enough marks that I got what they called a trustees' scholarship, which paid half of my tuition and books. I had to work part time to get enough money to pay the rest of the tuition, I worked under what they called the NYA, National Youth Administration. You worked about 40 hours a month for a very nominal sum which was then applied to tuition.

When I decided to enroll at Hopkins my brother, being 10 years older and having had a rough time of it, said, "You must take electrical engineering because that's where the future is." And I said, "Yes, I guess you're right."

However, because I didn't get that scholarship right away, I didn't enroll right away. In fact, it was two weeks after school had started that I got the call from the dean who said, "The trustees have gone over your record and they've given you this scholarship and this NYA job." So I came in and I found that I had already been enrolled in civil engineering, which was based on my original preference as stated on my application. I knew full well that electrical engineering was where the jobs were, but I was enrolled in civil engineering and they had my class schedule all worked out for me. The class schedule for engineering was pretty well defined, and it was a civil engineering course which included surveying. Of course, that's what I was interested in. So that's really what directed my career-I got to be a civil engineer because of my interest in maps and surveying. One of the other things I think that had a big effect on my career was the fact that because of my weak leg I couldn't participate in sports as much as the other boys. My leg was not very strong after the first operation and my foot turned over when I ran.

When I was in the fourth grade, I had another operation in which they inserted another bone in my foot which kept it from turning over. After that, I could run and play ball and do things like that, and take long walks. Before that, I couldn't and so I was doing a lot of reading, even in those early years because that's what our family did. The whole house was full of books of all kinds and I did a lot of reading. My sister also brought her books home from school, and I used to read her books three years ahead of the rest of my class, so when I got to most of my classes, I was well prepared and didn't have to study much.

And I did reasonably well in school with good marks and all, but my family never made an obsession of it. They never said anything, except if I got a C my father would say, "Gee, what happened?" because most of my marks were As and Bs, and-but they never drove me to excellence in school or anything like that.

And then the thing that had a major effect on my education happened when I was in first year of high school. In early May, after school one day I was riding on a bicycle out to the farm, which was three miles away. The front tire blew out as I was going down a steep hill. I went head over handlebars, and the bicycle landed on top of me. I had a broken leg, the femur just above the knee. I went to the hospital in early May, and they put me in traction, trying to gain a little bit of length because my right leg had ended up shorter because of the polio.

I was in the hospital until about the 4th of July, and then I was around on crutches all summer. That was the summer that my education really took off. My brother had never been able to get through college. Determined to educate himself, he had bought the Harvard Classics, and the Harvard Classics Library of Fiction, and I literally think I went through the whole of those volumes, 50 volumes of the Harvard Classics, that summer. Now, I know a lot of that was too much over my head for me to understand, and a lot of it I skimmed-

Then there was a complete set of Dickens. And the Waverly, novels of Sir Walter Scott. I did a lot of reading. H.G. Wells, Will Durant, I wish I could remember it all. But the significance of it was it opened my eyes to the broader world while I was still a teenager.

A lot of this is already written up in my journals that I wrote from 1935 to about 1955. I've written a bit here and a bit there, and I've always thought that it ought to be documented-in a lot more detail about my family.

Q: Is it in publishable form?

A: No, no, no. It's just in drafts. In fact, it's not really very good-none of it has even been typed, but I used to write it in notebooks.

Q: I see. That's fine.

A: Because I think what I really wanted to be when I was a teenager was a writer. You know, I was very-well, poetic. I know I don't have that kind of talent, at least I don't think I do, but some people thought that I did and used to encourage me to write.

Q: Well, you were talking about these 50 books-the Harvard Classics series, and how this helped you—

A: Well, I think reading a lot of good literature is how you develop the ability to write, and that's had a big effect on me because the ability to write and communicate either in writing or verbally is very important.

Q: Yeah. It's a bit unusual, at least to me-and perhaps I'm showing some bias of my own here-for a person with an engineering bent to have also an enthusiasm for the classics, for reading and writing and so forth. So that's—that's a bit unusual. Do you think it's in some ways helped you in your career?

A: Well, I do think it helped me in the ability to communicate, and when you get down to it, communication, either writing or speaking, is essential in any profession, and that's why I mentioned it. I think it did have an effect, which I didn't really realize until many, many years later and I realized that I did have the benefit of a much better classical education than most people who went through engineering school-at least who went through engineering school at the end of the 1930s.

Now, a lot of what I read I can't really remember-I can pick up those books and look at them now and I can't imagine that I ever read them, because some of it's pretty hard going for me even now, some of those early novels and all that. But I laid on that hammock under a big maple tree and read one book after another-I was on crutches all summer.

I never did finish my school work but even though I didn't go to the last six or seven weeks of school because I was in the hospital, they passed me because I had good enough marks up to then.

About the end of August I was off of the crutches and went to school and the first day of school, I slipped on something in the hall and I was back on crutches again.

Q: Are you sure you just didn't want to read some more?

A: Well, no, because even if I did, it didn't work. One of our neighbors used to drive up to town-it was only about three-quarters of a mile-and so she would drive me to school every day, and I came home on my crutches. Now, you know, three-quarters of a mile is not too far to walk on crutches, but it caused me to wear the tips out about once a week. I remember at the end of the week after the tip was worn out, if you didn't get a new one on quick enough, well, the wood tended to open up like a cauliflower and the crutch would be a bit shorter.

But anyway, that didn't last very long. I got to the point where I was all right again, and I was a key person on the intramural basketball team because I had gained in height-I had grown about six inches while I was in the hospital because they were feeding me protein and milk and everything to make my leg grow a little bit longer. So I had suddenly become perhaps the tallest person in the class, and I was in great demand as the center on the intramural high school basketball teams. In those days, you remember, after every basket the ball came back to the center for the tip-off, and even though I wasn't very fast on the court, I had the edge on everybody else for tipping off. Aside from that, I was probably the world's worst basketball player, and I never was really good at team sports.

But we did play softball. I used to play softball. Until I was in the fourth grade, I couldn't do much of that kind of sport, but when I got to the fifth grade after the operation that strengthened my foot, even then I was one of the tallest people in the class. We used to play softball at lunchtime, and we played a game called "three-at-the-bat." Everybody called off-the first three in numbers and then the rest in team positions. The first three would be at bat and then the next one would be catcher, pitcher, first, second, third base, shortstop, and all the way out in the field. No matter how many people were there, you could always play without organizing a team or anything, and you progressed upward through each position as the batters were put out, and when you were put out you became "last-man-in-the-field."

Well, there were three fellows that were bigger or tougher than I was in the fifth grade and-so they always were the first three, you know, and if you argued with them you might find yourself looking at a fist. So, I would be four, and would start as catcher. That was the one position I could play with

reasonable skill, and then as soon as somebody went out, I'd be at bat, and I'd usually, maybe, get around the bases once before I was out. I could run, but sometimes people would volunteer to run for me because I guess I ran with a kind of a hop-leggedy run.

That was when I started in organized sports, I played softball then off and on with class teams, not with varsity. Sometimes I played soccer, and sometimes basketball. Then I started to play golf. I loved golf. I learned to hit the ball in the meadow on the farm near where we lived. I taught myself to play golf with my brother's clubs, and then I became a caddy-this was about when I was 12, 13 years old-so I could play golf on caddy day. One Monday, which was caddy day, I got around 54 holes on our nine-hole course in Reisterstown. We didn't get much work, as caddies, because people couldn't afford to take caddies back in the early '30s.

And so the only varsity sport that I ever got involved in was the golf team in my senior year at high school. I also started swimming regularly, I guess by the time I was in high school-I taught myself how to swim by reading in a book. I went into the water in our farm one Sunday with neighbor boys who took me out there-they asked my mother if I could go and she said sure. I had read a little book called "Healthful Sports for Boys," and it had a section on swimming. It told about the breast stroke and the crawl and the backstroke and the sidestroke which they used to talk about then. I read about the various strokes, and that the first thing is to not be afraid of the water. To conquer the normal fear of water you filed the wash basin full of water and put your head in it and opened your eyes and you'll find out that you can see under water, and once you get over that, why you'll find that swimming comes easier.

So I went out to the farm with the Warner boys-1 know my mother would have had a conniption fit if she knew what I did. There was a swimming hole in the Patapsco Falls where it flowed through the farm. There was a gravelly beach where we could get down the bank to the water, so I walked down and stuck my head in the water and opened my eyes. I couldn't see a thing! The water was muddy. But that didn't stop me, and so I guess I probably dog paddled across to the other side and put my feet down and there wasn't anything down there. It was one of those places where the water was deep.

Well, I guess some people might have panicked, but I didn't. I just turned around and dog paddled and came back to the beach, and from then on I could swim.

We swam a lot during the summer when I was in high school, mostly in a neighbor's pool. These neighbors had a lovely pool, and this reminds me of one of the harsh facts of growing up around Baltimore in the 1930s. There was an awful lot of anti-Semitism. The neighbor children had gone to the public swimming pool in Glyndon and-1 don't know how people could tell someone was Jewish, but at the public swimming pool whoever was on duty said, "You can't come in, " and they asked, "Why not?" And he said, "We've got too many. " And then finally the manager came out and said, "We don't allow your kind in here."

There was a small creek running through our neighbor's farm, so they dammed it and built a swimming pool and invited the whole town to swim. They built just an ordinary little pool, and then the electric company put a new high tension power line from Safe Harbor on the Susquehanna River down to Baltimore, which came right over this pool. It wasn't safe to swim there, so the company-it's now Baltimore Gas and Electric Company-built this beautiful pool about 50 yards by 30 yards. So the whole town was invited to come out there to swim. I don't know whether it helped or hurt the business of Glyndon pool that much or not, but it must have because we all swam there, and we were welcome all summer. Some summers I would count the times I went swimming, and it would be something like 100 or 110 or something like that, and each year I'd try to beat the previous record. The pool was about three-quarters of a mile or a mile out Berryman's Lane from my house, and I walked it all the time.

Q: What was the neighbor's name, do you remember?

A: The name was Dorman, D-o-r-m-a-n. The farm has been taken over by some kind of an institution now and I don't think the pool is still there.

But that's one of the unpleasant facts of life, growing up in the 30s. We didn't think much about it, but Baltimore was very segregated, not only the black race, but also the Jewish people. Of course, the Jewish people had some of the really fine sections of the city; you couldn't call them ghettos. But in the sections around Johns Hopkins University, Guilford and Roland Park, I think

they went back three generations to find out if you had any Jewish blood. It was that kind of a snobbish society. I know they don't like me to say that, but it's a fact.

Anyway, I became a good swimmer. I used to swim a mile a day. When I first started I was swimming side stroke and any kind of a stroke, and I learned all the strokes, and eventually swam the crawl because it was the most efficient. And when I got to Hopkins I did go out for swimming, and I was on the freshman swimming team. I could do that the first year but the course schedule was so rigorous in the sophomore year that I had to give it up. I also tried to get into ROTC, not so much because I wanted to be a soldier in the tradition of my father and grandfather, but because they paid you the last two years, and that would have been very important.

I remember going to see Colonel Gregory Hoisington. I don't know whether he was a Corps of Engineers officer or not-and asking him if I could enroll, and he said, "No, no, we just can't-your leg's shorter and you walk with a limp and we just couldn't have you in the service. " And I said, "Well, gee, I can do everything. I can walk miles and do this, that, " and he said, "No, I'm sorry, but we can't take you."

I had to take something else to fill out my schedule, so I took French reading. Having had French in high school, after one semester I absolved the requirements for French in the Ph.D. I would have had to take an exam, but they certified that I could take it, so I had some time off, which I promptly used to play bridge over in Levering Hall.

Upon entering Johns Hopkins they gave you placement exams and I absolved taking English composition. This permitted me to go right into an advanced English literature course with the person who, I believe, is the best teacher I ever had, Captain Kilbourne, formerly of the British Army. He may have been a U.S. citizen by that time, but he lived and breathed English literature from *Beowulf* on. With my having had a kind of a literary background from all the reading that I had done, but not having been very organized, he really helped me organize it, although years later, when I looked at some of the papers I wrote, they seemed rather insipid and immature, but still it did help to really inculcate the love of English literature in me.

Captain Kilboume was steeped in the love of English literature. He could read *Beowulf* and Chaucer and he could just make it come alive in the same way that good actors can make Shakespeare live, whereas when you just read it, you don't always get the flavor of it. Unfortunately my high school courses in English-in English literature particularly-were not too good because they were so unimaginative. By the time I got to high school English literature, I had read *Ivanhoe* and *Quentin Durward* and the *Bride of Lammermoor* and almost all of the Waverly novels, which I just loved, and it was amazing to me how the teacher could make them seem so dull and uninteresting.

Well, I'm not really a classical scholar. I just enjoy literature.

Q: Let me ask you this. First of all, you'd taken French. Now, did you still have some working knowledge of German at that time?

A: No, very little. And I never took German, but I had tried to learn to speak it with my sister when she took it at Western Maryland College.

Q: What about-I'm still a little bit mystified as to why your house was so crammed full of books. I mean, your father, photography work and a shirt ironer, what led him and your mother to have that kind of an interest?

A: I think that what started it was that they inherited all the books from my grandfather when he died in 1911. I think a lot of the books came from my mother also. She had lots of books that were hers and were of a later vintage. Also they bought a lot of books up to the farm years and then their interests, I guess, became different. But no, there were all kinds of books, and it was not at all unusual for three or four of us to be sitting in the living room and reading on a Sunday afternoon.

And the other source of books was my brother-remember, 10 years older than I-but only one year at college. My father didn't have money to send him because of the losses on the farm. My brother got a scholarship for tuition, but he had to work for his room and board. He went to Randolph-Macon College-not the women's college, but the one down in Ashland-he got his scholarship through a program they called the CMTC. He went in the summer to the Citizen's Military Training Corps, which was the 1920s version of military preparedness. He was good at it, and he was awarded a scholarship. But he had to work for his room and board, and he didn't make it.

So he was determined to educate himself, and he started buying books during the boom years of the late '20s. He made a lot of money in the first few years selling radios. He was selling radios at the time when the salesman just sat there in the showroom and wrote the orders as fast as he could write them. This, you remember, was in 1927–28.

So he made a lot of money, and that's when he bought the Harvard Classics and a lot of other good books. He bought good books, like the Merezhkowski trilogy-H. G. Wells' *Outline of History* and *The Story of Philosophy* by Will Durant. All these are just a few of the books I remember, much more than my family's books, but there were several bookcases full of older books.

It always seemed that reading was the way to go, I think, in our family.

Q: Let's talk about Johns Hopkins.

A: Well, okay. I think I told you about absolving French reading and English composition and having a wonderful English literature course. But still, I was taking engineering and so the first year I took engineering drawing and surveying and mathematics, physics, and chemistry, which are the basic courses for going into engineering-the only engineering, in the first year, being surveying and engineering drawing.

And the swimming team was one interest. Then I started up a freshman golf team just so I wouldn't have to take physical education. We played mostly high school teams like Friends' School and Tome, up in Port Deposit, and other prep schools. I'm not sure any of the colleges had golf teams, at least I don't remember playing any college freshman golf team. I was not all that good at golf. If I ever got an 85, I thought I was really doing well, and I think maybe the best round I ever shot in those days was an 81 or so.

Q: Were there any particular professors at Hopkins that gave you inspiration.

A: Well, only Captain Kilbourne- i n the freshman year that is. The next year my calculus teacher, Dr. Zariski really turned me on. At one time I considered changing my course, from engineering to mathematics.

Q: Okay.

A: Sophomore year, I went out for swimming, but there were two people so much better than I was that I knew I couldn't make the team and also I was very busy. In sophomore engineering at Johns Hopkins in those days, you had about a 40-hour a week schedule of labs and classes. Also I was working on the yearbook. It was the major activity that I kept up. I was on the staff of the yearbook all four years and was editor in my senior year. But you really start working in sophomore engineering and remember, I was commuting with my father, and if I stayed late, I had to hitchhike.

So I really started to hit the books more then, and I guess after the freshman year I wasn't able to sneak over to Levering Hall and play bridge. Bridge was an obsession with me as a child growing up. I just loved the game, having started off on auction bridge and then when they started playing contract, that was just like real big-time stuff and I really enjoyed it. So I've always liked to play bridge.

Anyway, so on through my sophomore year. In those first two years my NYA job was working in the chemistry library as a typist and the other thing that I did to make a little bit of spending money was type term papers for people. I took touch typing in high school and in those days, the going rate was 5 cents a page for double spaced and 7 cents a page for single spaced typing of term papers. That doesn't add up to very much money, but that was the going rate. But you could buy a hamburger, a little hamburger at the Little Tavern, for a nickel and a bottle of milk for a nickel and a piece of pie for a nickel. Remember this was 1935, '36, '37 and things were pretty low economically.

I gave up eating lunch. My mother said she had made lunch all through school for three children and it lasted for her-my brother being 10 years older than I-about 20-some years, and she, "I've made enough lunches, but you can make your own lunch if you want." And I was 17 years old by that time and didn't really like sandwiches, and I didn't want to bother making lunch so I just gave up eating lunch, even when I was swimming in the afternoon. At that time, I remember talking to the swimming coach about it, and he said, "You're really swimming on your breakfast, and if you're in the habit of not eating lunch, it won't make any difference." So I was eating really two meals a day, and once in a while maybe getting a milkshake, and that was in the days when a milkshake was two tall glasses of nothing but milk and ice cream and good stuff. And I'd do that once in a while, and that would cost 10 cents and I could afford that.

So that was what you might call poverty. Now, when I say "poverty," it was a genteel kind of poverty. We just were land poor and didn't have any money. Otherwise, it was a rich family life.

In my junior year something happened which had a major effect on me. Abel Wolman moved from the Hopkins School of Hygiene and Public Health, where he had been teaching-he was also head of the Maryland State Department of Health-to the Homewood Campus. The School of Hygiene and Public Health is associated with the medical school campus over on Broadway in east Baltimore.

Professor [John] Gregory had been professor of sanitary engineering. He left and Abel came to the Homewood campus as the professor of sanitary engineering. And I got the job as his student assistant. I can't remember whether I asked for it or whether they just figured it was a natural. They assigned me to be his student assistant under the NYA program, and my job for a whole year, working 40 hours a month, was to unpack his library, catalogue it, and put it on the shelves. Abel had an office on the second floor in Latrobe Hall, and he had an adjacent room which was his library. The ceilings must have been-they seemed like they must have been-12 or 14,15 feet high. The walls were lined with shelves all the way to the top. There were two rolling ladders on tracks, one on each side, that you could climb up to get to the top ones. So I spent that whole year in my spare time unpacking books and cataloging them and putting them on shelves. But it certainly gave me an insight on Abel, because I was always there late in the evening and whenever else I could find time to work, because engineering students had a full course schedule at Hopkins. Frequently I got the chance to talk to him and ask him about things. He really had such a tremendous volume of publications some of which seemed to me to be very esoteric.

He had all the reports of various sanitary districts, the ones in this country, such as the Miami Conservancy and the Muskingum and all of the others, plus he had a wealth of foreign publications. The ones that stick in my memory are the annual reports of the West Riding of Yorkshire and the East Riding of Yorkshire. These were the reports that told about what they were doing in the public health and sanitation field in England. And new reports were coming in all the time.

Of course, Abel is so well known, I don't have to say anything about him. I know everybody who reads this will know who he was. But he was an international consultant even back in those days, which was pre-1937. He came to the campus at Hopkins in the fall of '37.

Q: At this time, he was already involved with the Natural Resources Committee?

A: Oh, yes, and at that time a lot of these publications, the new reports and papers that were coming in were from the Water Resources Committee of the National Resources Committee and eventually the National Resources Planning Board, although really it was not named that until about 1939.

Anyway, so I was steeped in all of that. Now, I did not take hydraulics until the third year, the junior year, and I didn't take sanitary engineering until the fourth year, and I still just loved the surveying. In my sophomore year, I took railroad surveying. And in the second semester of my freshman year when I absolved the French I couldn't just goof off for that hour, which was four times a week, so they let me take advanced surveying, and that was a thrill because I was with the senior class of 1936 at Hopkins. Taking advanced surveying involved things like shooting the North Star at night and what they call the three-point problem and the two-point problem and all the techniques which require an awful lot of trigonometry. I just loved it, and at the end of the year I remember getting a 10, one of only two or three given in this course of seniors, and I was only a freshman. This was what I wanted-surveying was what I wanted to do, so I loved that course and the association with the senior civil engineering students.

And all this shows how chance really affects your life. Although in the background, I've always loved water, at that time in my life I was headed in another direction. But I think everybody loves water. It is a part of the human psyche. There is something about it that appeals to us. A lot of people have written more eloquently about that than I ever could. And I was getting an education that would help me when I got pointed in the direction of a career in water resources.

In my senior year I had my only course under Abel. He taught a course called Legal and Social Aspects of Engineering and I'd say of all the courses I took, it was the one that had the most relevance to my future career.

And Abel had the facility of making it all come alive the same way that Captain Kilboume made English literature come alive for me. For example, I had to do a paper on metropolitan area governments and I floundered around. I interviewed the chief engineer of the Baltimore County metropolitan area government and I read all kinds of things and I wrote the worst mishmash of stuff you can imagine. And showed it to Abel, which we had to do before we presented it. This was a seminar course. Each week somebody did a seminar, and this was one of my subjects. He took my draft and he read it and he asked me two or three questions, and all of a sudden, I understood what it was all about, and I went back and revised the paper and it was a reasonably good paper.

But he didn't tell me anything. He just asked me a couple of questions and it made it all come together, and he did that with me on several occasions. He was that kind of a teacher. But I really only had him in that one course. Of course, I also had him as a boss because I was his student assistant, but he never got me to really help him with any of his work. It was mostly sorting out all those publications and asking where to put them. Of course, he would talk about what was going on in Washington and tell me about his meetings as he was almost commuting daily to Washington in those days, to the meetings of the Water Resources Committee of the National Resources Committee at that time. It was before they called it the NRPB [National Resources Planning Board].

So I got to know about the alphabet agencies as they called them-and, of course, Abel also was very much involved in either the PWA [Public Works Administration] or the WPA [Works Progress Administration]. I can't remember now. He was Maryland director or something like that, because he was a very, very competent administrator. He really handled his staff the same way he handled me when I showed him a mishmash of a paper, and by asking two or three questions, he showed me how to fix it up. This is the sign of a good administrator. You get your staff to develop and do all the work by asking them questions, getting them to think.

It's hard to say whether my exposure to Abel Wolman is what got me into water resources or not, because of some other things happening.

In my senior year, I was editor of the college yearbook, the *Hullabaloo*, it was called. I gave up working for Abel because I just couldn't see my way clear to

do the 40 hours a month on the NYA job, and I borrowed the money for the last year's tuition. My scholarship, was cut off after the third year and the university loaned me the money. They said that was the way they'd do it. They wanted to make the money for the trustees' scholarships available to people that couldn't otherwise go. But I had a good enough record that the college was just willing to just take my note for tuition—which at that time was $450. In those days that was high tuition. It was the same as Princeton-I think MIT had gone up to $500 and was the highest. My sister had graduated from college in 1936—her tuition was only $150 a year at Western Maryland College.

Q: I was going to ask you, I'm interested in what kind of subjects Wolman probably covered in a course on social and legal aspects of engineering. Would he have covered things like multipurpose river development, for instance?

A: Oh, definitely, -and he covered all of the things that the National Resources Committee was doing, and that's where I first learned about the Corps of Engineers and Bureau of Reclamation, and you remember, this is at the time when the Corps was building Bonneville and the Bureau of Reclamation was building Hoover Dam, the Central Valley project, Grand Coulee, and all of those Depression Era projects. Each person was assigned a topic-one would cover irrigation and one would cover flood control, and so that's where we did start our research-but we were looking more at the underlying-the underlying reasons for all these programs.

But it was much more than just water resources because the course was also dealing with what we now call infrastructure-highways and other public works-but with a heavy emphasis on municipal water supply and sewerage, which was his field.

Of course, at the same time, I was taking sanitary engineering under Dr. John Geyer and I was taking bridge engineering under Professor [Thomas] Comber. At that time, Johns Hopkins was putting out graduates who could leave their desks, or their academic environment and go to work for a consulting engineering firm and design a bridge or design a structure. We designed plate girders. We designed concrete arches. We designed all kinds of bridge trusses, to the extent of actually drawing them and detailing the number of rivets and designing every part of the structure, and so that's why the course was so rigorous. We were probably spending 40 hours in classes and laboratories, and

then there was homework. Being editor of the *Hullaballoo* also took quite a bit of my time. I don't know how I did it all.

And I had a few other activities. I had been on the YMCA [Young Men's Christian Association] cabinet and was editor of the YMCA handbook, was a member of the student council, and various other things, which I don't remember much now.

But anyway, I was really ready to go to work on a drafting table for Greiner Engineering Company or Whitman, Requardt and Smith, or any of those companies. It was 1939 when I graduated, and I started to pound the pavements looking for a job.

Now, going back to the summers while I was at Johns Hopkins. The requirements for a degree at the time were that you have at least six months of some kind of practical engineering or subprofessional engineering work before you get your degree. If you didn't have it, you'd get a roll of white paper at the end if you otherwise had completed the course requirements, and you didn't get your diploma-it was called "Bachelor of Engineering"-you didn't get that until you had six months of experience. They didn't want to put out somebody that didn't know which end was up as far as work was concerned. My summer job after my sophomore and junior years was surveying for the REA [Rural Electrification Association] power lines in southern Maryland. I worked for a Colonel P. M. Anderson, whose office was in Washington.

Q: What were you doing?

A: He had contracts with the Rural Electrification Administration under which I worked on the survey for the Southern Maryland Tri-County Electric Co-op in the summer of 1937 and again in the summer of 1938.

I got the job from an ad in the newspaper: salary, $20 a week plus car expenses. I hitchhiked over to Washington for this job interview. Colonel Anderson's office was in the Investment Building, 15th and K Street, and I'll never forget that hitchhiking. I went down to the Washington Boulevard in Baltimore and a guy with a semitrailer stopped, picked me up, and when we got out of town he said, "Say," he said, "I'm getting awful sleepy. Could you drive this rig for me?" It was not an 18-wheeler. It was a smaller tractor-trailer-I guess you'd say a lo-wheeler or something like that. But it was a big

truck and I drove that thing, and this guy actually leaned over and was asleep and I drove all the way over to Washington. I, of course, was a competent driver because my brother had taught me how to drive when I was 12 years old but-as a matter of fact, I didn't even have a car of my own at the time. So I was really scared and drove very carefully.

We came in New York Avenue, and I got so scared of the heavy traffic that I pulled over and woke him up and I said, "Well, this is as far as I'm going. I'm going to have to get out here." This was on New York Avenue, probably over—

Q: Bladensburg or something?

A: Well, a little bit farther in than that-about 17th Street, N.E. Anyway, I got out even though I didn't realize how far it was to Colonel Anderson's office because I was in northeast and I had the address 15th and K, and here we were around, I don't know, the 1700 or 1800 block of New York Avenue, and I thought I was nearly there. But it turned out I was in northeast-I had to walk all the way over to northwest Washington.

But anyway, they hired me. I went down to start work in La Plata as a member of the crew, and we were surveying in Accokeek, right near the southern tip of Prince George's County, I got all over southern Maryland that summer. I worked the first few weeks for $20 a week and got car expenses of 3 cents a mile. My grandmother loaned me the money to buy a Model A Ford and the interesting thing was, I could make money at 3 cents a mile with a Model A Ford-not paying for the car, of course.

After three or four weeks, somebody else quit, and I became a party chief at a salary of $110 a month, which was munificent in 1937. In fact, my mother, when I told her, said, "Maybe you ought to just drop out of school for a year and hang on to that good job." And thank God, I didn't do that. But anyway, it was nice to be making a little bit of money. And that was maybe one reason why I gave up working for Abel that last year, because after working during the summer after my junior year, I was able to save some money and I just felt that the time was more important than the little bit of money I could make on the NYA job.

After finishing up in southern Maryland, I worked down on Northern Neck for the Northern Neck Electric Co-op. I worked for the Bull Run Electric Co-op and then eventually, the next year, made an inventory of the whole line in southern Maryland. One Christmas holiday, I remember going down to finish up some work-working for two weeks during the Christmas holiday down there in southern Maryland just to get a little bit of money. So I did get to use my surveying, but when I got out of college there weren't any jobs. I tried to get back on an REA job over on the Eastern Shore, where one of my buddies was working, but that didn't work out.

Engineer Division, Baltimore District

I'm pretty sure we graduated on about June 4, 1939, and I pounding the pavement seeking appointments and interviews with potential employers for a week. Then I went back to Hopkins for something and someone, I don't remember who it was, told me, "I understand that the Corps of Engineers is hiring. Maybe you could go down there." And that's how I became associated with the Corps of Engineers.

But you mentioned the other professors. The other professors that I particularly remember at Hopkins were Truman Thompson who taught transportation engineering, and he also taught concrete and various things like that, and John Geyer, who was brought in to kind of understudy Abel Wolman, and did succeed him later as head of the department-he was a sanitary engineer of quite some note, coming out of Harvard. And the one that I worked a lot with was Tom Hubbard who taught surveying. Of course, I had a real affinity for him because of my interest in surveying. Later I had a real falling out with Truman Thompson because he didn't think I applied myself well. During that last year, with the work on the *Hullabaloo* and various other extra curricular activities-I was on the student council and working with the YMCA-I didn't seem to have much time for school work. My marks had been very good up through the junior year, but there was a real drop-off in the senior year, just because I was doing other things.

At times, I guess everybody in college thinks, "Well, maybe I should continue my studies and get a master's degree." But Truman Thompson, who was the department head, didn't encourage me to think about going on, and he said, "I hope you get a chance to continue with surveying. I know that's what you're

really interested in, and I hope you can find a career in that field." At another time he said, "I can't do much to help you, but if you ever get a chance to be county surveyor somewhere, take it. That's a good job. It doesn't look like much, but," he said, "you get all those fees for doing various things. You ought to look for something like that."

This was the advice I got from the head of the Civil Engineering Department who obviously didn't think very much of my ability. Abel was just a professor of sanitary engineering, and I don't remember getting any advice from him at the time.

So anyway, I went down to the Corps of Engineers office, and I know exactly the day it was. It was June 13, 1939.

Q: Before you continue with that, can I interrupt you?

A: Sure.

Q: I want to pick up a couple of threads from your college years, still.

A: Sure.

Q: First of all, you explained in a very interesting way how you stayed in civil engineering-in other words, your brother suggested you go into double-E and you didn't, you went into civil engineering.

A: Yes.

Q: Did you ever think again about going into something other than civil engineering when you were at Hopkins, or once you got in there you decided that was the way you were going to go?

A: Oh, I knew that's where I wanted to be, because remember, I had the surveying courses for a couple of years and my summer surveying work-and then-1 liked the hydraulics, which was a course I took in my junior year. But the course in hydraulics was not a particularly good course because, for one thing, they didn't have enough money. The hydraulics lab was a little bit antiquated, as I look back on it now, although it seemed wonderful-all those big pumps and pipes and tanks and channels-but we couldn't run the big

pumps because of-1 don't know why, but we did enough things that were fun. Also, of course, a lot of it is theoretical-Reynolds number and the Manning formula and all those things that were just coming into use at the time. I think we did learn how to do practical things like flood routing and things like that. That served me in good stead when I started to work for the Corps and the Bureau of Reclamation.

So anyway, I never really considered anything other than civil engineering because I wanted to be outdoors. Remember, I had been kind of-well, almost a cripple up until I was in the fourth grade, and so I wanted to get out, in the outdoors and work in the outdoors. In civil engineering you worked in the outdoors. That's the way, I looked at it.

Q: But in particular, you wanted to be a surveyor. That's kind of what interests me, because, as you pointed out just before, here was a time during the Great Depression when all these great projects were being built: Bonneville, Grand Coulee, Boulder, Fort Peck, etcetera, etcetera. I get—

A: There was always a man out there with a transit, laying the thing out, and this was the engineer. He was there with the transit, telling the contractor what to do. Professor Comber told us we would be underpaid. He said, "If you want to make money, you should operate a steam shovel or a bulldozer." But the engineer tells them what to do. I was inculcated with the fact that the engineer is the one that is going out there first and telling them what to build.

Q: But, you know, I've interviewed, of course, a lot of engineers and, you know, one of the things that seemed to attract so many people was the design work. You were going to design the great dam. You were going to design the-you know, even just a spillway or something, something that really was tangible and was going to be put on the ground. That didn't hold, evidently, the same attraction for you?

A: That was paperwork in the office, you see, and I wanted to be out in the outdoors. Again, remember, I was only 20 years old when I graduated and I guess I was pretty immature.

Q: Yeah.

A: You don't really do an awful lot of deep thinking at age 20—well, I guess you do some deep thinking-in fact, that's when we have time to do it. But anyway, that was the way I was thinking then-it may be an anomaly for someone who has done what I've done over the years.

But anyway, I actually had a June 13th appointment for an interview at the Baltimore District Office of the Corps of Engineers. I had called up and made the appointment, and I went down there, and I was interviewed by John T. Starr, who at that time was chief of the Drafting Section, which was part of the Design Section in the Engineering Division. The head of the Design Section was Doug Chittenden-his father was an old-time Corps general and all that. But these were civilians, of course, and I can't even remember who the district engineer was.

So I went down to the Baltimore District Office in the Calvert Building and, to my recollection, the interview with Mr. Starr consisted of just three questions. The first one was almost like a statement-John Starr knew I was coming and he said, "Now, you just graduated from Johns Hopkins this year?" And I said, "Yes. Yes, sir." And he said, "You took civil engineering?" And I said, "Yes, sir." And the next question: "Can you start work this afternoon?"

And I was flabbergasted, but also I was interested in railroads. We lived up near the Western Maryland Railroad, and it just happened I had an appointment with the Engineering Department of the Western Maryland Railroad that afternoon, and so I didn't say, "Yes, sir." I said, "Well, let me think about it. I'll call you back."

And so we talked a little bit more, I'm sure. He told me a little bit about the work and all that. He said, "You'd be doing strictly drafting at first, and then eventually work into design. " I would be working on the small structures first-on the Susquehanna River flood control. That's what gave the Corps the impetus for hiring at that time. Money had just been appropriated.

This was a temporary job, salary $1,800 a year. The position was called SP-5, I believe, which would be about the same salary as about a GS-4 at the present time, I guess. I am not sure. This was before the government amalgamated the sub-professional, professional, and clerical schedules into the GS schedule.

And so, during the interview we talked about the work, and I got a picture of what it was going to be, but it was going to be drafting work in the office there. The office at that time, for the Engineering Division, was in the Calvert Building, which was at the corner of Fayette and Light Streets-at the bottom of St. Paul Place in Baltimore. The building is gone now, replaced by a new office building.

After the interview I went out to the Western Maryland Railroad office that afternoon because I still had visions of working outdoors. My younger daughter has the same feeling. She doesn't want to work indoors. She wants to work outdoors; it must be in our genes.

Anyway, at the railroad it was a typical interview. "Yeah. You've got a good resume. Don't call us, we'll call you. Right now there's nothing, but we may have something in the fall and we'll call you."

So I called up John Starr and I said, "I'll be in in the morning if you still want me." He answered in the affirmative so I started to work on June 14, 1939. Ever since I got that job, I've had a great affinity for the Corps of Engineers. I think it's one of the most efficient agencies in the United States government. Not always efficient, but-but let rne tell you an example, which also will tell you why I remember that the interview was on June 13, 1939, and that I started work there on June 14. In those days, working for the federal government, you got paid on the 15th and the last day of every month. Everybody griped about that extra day you worked on the 31st. They never said a word about February 28th, getting that half month's paycheck for only 13 days' work.

On the 15th, which was on Friday, the second day of my employment, the paymaster came around with his file of checks and I can't remember for sure what he said, but I can reconstruct it. He said, "What's your name, boy?" And I said, "Well, my name's Ted Schad, but you won't have a check for me, because I just started work yesterday." And he flipped through his file, and he pulled out a check which was for $10 for two days' pay at $150 per month. Remember, in those days you got paid actually by the day and so, you know, $150 is $5 a day. Can you imagine getting a pay check on your second day of work for the government today?

And I'll never forget that, because that was my first paycheck on a regular job. Well, I had paychecks previously from my summer work, but this was really

something-to be on a payroll, so I walked right down and cashed the check at a nearby bank-1 needed the money. Otherwise I'd have kept that check and framed it. But $10 was a lot of money in those days. It was Friday, and I needed it. So that was my start with the Corps of Engineers.

I started work at the same time as another young man who was an architecture graduate. We were put into a squad headed by an architect named Bert Lichtig-L-i-c-h-t-i-g. Bert was one of these self-made architects that had never gotten a college degree, and he said something like this-"You know, I don't have a sheepskin, but I don't really need one. Just because you've got that piece of paper that says you're an engineer"-or to the other fellow-"you're an architect, " he said, "That doesn't mean anything to me. I got to see what you can do. " Then he said, "What I want you fellows to do is to draw the borders and the title block on linen for my men to fill in the drawings. "

At that time, every job had detailed plans and specifications prepared before bids were taken. The plans were drawn up in India ink on linen. We were working on plans for the Susquehanna River flood control, so I spent my first couple of weeks drawing those borders and title blocks for the plans. The other fellow and I made a game of it, to see who could do the most. I don't think we ever did more than seven or eight a day. I think the maximum was about eight a day. We were putting down—first, at the top, you remember, it wasn't the Corps-it was U.S. Engineer Department, or U.S. Engineer Office, something like that. I have a towel that I stole as a souvenir of my first job-the statute of limitations has run out, so I can tell you-it says, "USED" embroidered in red on it. Every draftsman had a towel that he used to keep his hands and cuffs clean so that he wouldn't make a smear when he was working on those drawings.

On the other corner, at the top, it said, "War Department." And the title block had the name of the project, and the name of the drawing, and always " Prepared by.. ." "Reviewed by..." "Submitted by.. ." and "Approved by..." and the name of the district engineer and the chief of the Engineering Division-all that in 020 Leroy. Well, that's mighty fine print, and if you're not real careful, you'll smear it. Finally, down in the title block, it said, "United States Engineer Office, Baltimore, Maryland District. "

Anyway, I did borders and title blocks for a couple of weeks-we were working on drawings for the pumping plants and levees for the Wilkes-Barre

project and I think John Starr took pity on me after a couple of weeks, or he realized that this was just my indoctrination, and then he moved me into another unit. The squad leader there was named Ken Gardner. But I really did start then to do some design and drafting of small structures-the small structures being things like headwalls and manholes and other minor facilities where you did have to know about reinforcing steel and things like that. However, there was no real major design. One of the projects I worked on that I guess the Corps of Engineers would probably just as soon I forget about was a project called "Toby Creek Pressure Conduit and Outlet Works."

This was part of the project for Susquehanna River flood control. They were designing for a hundred-year flood on the Susquehanna River. Somebody else was doing the hydrology. We were not. We were just doing the design after somebody else had decided what to do.

Right across the river from Wilkes-Barre are two small towns, Kingston and Edwardsville, that ran together. I think it's right near the line between those that Toby Creek came down out of the mountains and crossed the flood plain and discharged into the Susquehanna River. It's a right mountainous area with a narrow flood plain, and, of course, the big flood plain is on the Wilkes-Barre side where the city is. On the Kingston-Edwardsville side the narrow flood plain was subject to flooding when the river came up, just as Wilkes-Barre was on the other side.

The idea of the Toby Creek Pressure Conduit and Outlet Works was to take this stream that came down out of the mountains and back it up in an impounding basin to create enough head to force the water through a pressure conduit and out into the river through a headwall on the river bank with a floodgate, so that when the river was up, the water would come out, and it would be forced out because of the head from the impoundment but the floodgate would prevent the river flood water from coming in. The impounding basin was merely earth levees in a U shape to hold the water and give it enough head to send it out through this conduit, which was maybe a half-mile long, under pressure. It went right down to the river near the border between Kingston and Edwardsville.

I designed the headwalls and several other minor structures for the Toby Creek project, I can't remember the details of what I did. At one time, I did a whole job which was the biggest job I did-including the design and the drafting in

ink and the specifications for a railing along the levee in Wilkes-Barre. I was proud of that. That was my biggest job. I did the whole thing from A to Z, including getting it ready for bids and lettering in my own name in the title block, where it said "Prepared by.. . ."

Well, the Toby Creek pressure conduit was built around 1940 or '41 but the first flood that came down out of Toby Creek went into a hydraulic jump in the impounding basin. The water overtopped and washed out the earth levees and flooded down the stream depositing the earth and fragments of the structure down on the streets of Kingston and Edwardsville. This is written up in the *Engineering News Record,* but I can't remember if it was 1942 or '43 or when that flood came. And somebody just hadn't realized that this little stream coming down there and suddenly coming out into a pond would go into a hydraulic jump.

That's why I say the Corps would probably just as soon forget about the project-I'm probably one of the few people that remembers what happened, but John Starr would remember it, and I'm sure some others around the Baltimore District would.

Now, this was just a very little project. It wasn't a separate project. It was part of the Kingston-Edwardsville project which had levees and other components. I'm sure they fixed it up, but by that time, I was long gone from the district.

Q: Could you tell me something about the reputation of the Corps of Engineers among young engineers at this particular time? Was the Corps of Engineers a place where young engineers just out of engineering school would want to go? Was it a place where you would go if you couldn't find jobs with an independent consultant or an independent engineer? You know, it was a controversial agency, even at that time.

A: This was at a time, near the end of the Depression of 1930s. Some of the war work had picked up but there was still a lot of unemployment. People wanted to get on a payroll. They didn't care where. And the general feeling was that government payrolls were good payrolls. They encouraged us at Hopkins-in our junior and senior years-to take civil service exams. And so I had taken the exams-everybody in our civil engineering class had-for draftsmen and for engineering aide and for junior engineer. And one of our college classmates who had had to drop out after the junior year-Bob Linthicum, who was a

Corps hand for many, many years-he was fairly good at drafting, and he was hired in a sub-professional position in the Baltimore District before he graduated.

And so I guess there were no connotations that you only took a job with the government when you couldn't get one somewhere else. They were good jobs. I don't remember any controversy about the Corps in Baltimore.

My particular class of civil engineers thought it was just great to work for the Corps of Engineers because I had the highest salary of anybody in our class. Of course, we only had seven civil engineers in the class of 1939. One of them went to Glen L. Martin, detailing for stress analysis on airplane construction at 75 cents an hour, which comes out to $30 a week. Another one was a timekeeper on an engineering project at $25 a week. The guy who was the best draftsman got the first job, but he was only an SP-3 or something, because they were hiring draftsmen at $1,620 a year. And he thought that the Corps was just great, paying $1,800; that was a good salary in 1939.

Four of our class of seven went to work for the government. Two of them with the FAA [Federal Aviation Administration] and one with the Coast and Geodetic Survey. Another one went to Dupont and another went to the gas and electric company. But I was the only one that went to work for the Corps.

Graduate Work, Johns Hopkins University

I've already summarized the work that I did that first year. Around September, John Starr came to me and said, "Some of us are thinking about registering for graduate work at Hopkins. Would you be interested in working toward a master's degree? We would have to go out and be on campus for one course during the day, and we could take another course at night. Hopkins required you to be enrolled in the day school if you wanted to get a master's degree.

We were working a five-and-a-half day, 39-hour week at the time with lots of unpaid overtime, which was recorded as "comp time," so there was no problem getting off for an afternoon class, especially since the boss was also enrolled in the course. So I agreed to do it, along with John Starr and two others from the Baltimore District, Philip Kirpich, who was working in the hydrology section at that time, and Gordon Williams, who later went with

TAMS in New York. We agreed to take a graduate course in hydraulics and a graduate course in hydrology at Johns Hopkins. The hydraulics they could give us at night under Mr. [Fred] Medaugh and the hydrology was going to be every Friday afternoon under Abel Wolman, with John Geyer filling in when Abel couldn't be there.

A couple of fellows came down from the Philadelphia Electric Company and Conowingo Dam to register for the two courses. Abel's course was a seminar and we called it "A Hydrologic Analysis of the Susquehanna River Basin."

Now, Abel at that time was somewhat jaundiced about the economics of Corps projects and I think that the engineering profession generally thought that the Corps was kind of stretching the economic analysis to justify some of the projects. Abel's view was that when the Corps goes into a town to investigate a potential project that the government would build and the local people would have to provide the land, easements, and the rights-of-way, the town council will look at the cost of the land, easements, and rights-of-way and they will, in their heads, do a cost-benefit ratio of what they know the benefits really are and weigh them against the cost that they have to put up, and if they can see that ratio coming out favorable, they would agree to go ahead with it. He was very dubious about the Corps' cost-benefit analyses, particularly estimation of benefits.

You should remember, Abel was a consultant to the Miami Conservancy District where everything was computed down to a gnat's eyebrow, and they didn't build projects unless there were either collectable benefits or taxes sufficient to pay for them because there weren't any federal funds. I think Abel at that time was expressing the general views of the engineering profession, but I don't think this extended down to the graduates' not wanting to take a job with the Corps. In 1939 and 1940, you didn't analyze things like that. You wanted to get on a payroll. The effect of the Depression.

Anyway, we took those two courses, but I wasn't able to finish the last month because I was in an automobile accident in the spring of 1940 and had to drop out. In the summer I left the Corps to take another job. I should have said that my first job was temporary. It wasn't under civil service. They didn't take out retirement or anything like that, although I had benefits such as annual and sick leave. That's how John Starr could hire me the next day.

Survey Party, Constructing Quartermaster, Edgewood Arsenal, Maryland

About May or June of 1940 the marks on the civil service exam that I had taken when I was in college came through. You found out only when you were offered a job-at least, that's what I remember, because I didn't know anything about it until I got an offer of a position as senior engineering aide from the Constructing Quartermaster at Camp Holabird in east Baltimore.

You remember, this was between the two wars. The Corps was not involved in military construction. The Corps was solely involved in civil functions at the time. And the Constructing Quartermaster was doing military construction work, and they were just starting to work on the chemical warfare depot at Edgewood Arsenal. The offer I got was an invitation to interview for a job as senior engineering aide at Edgewood.

So I went down to Camp Holabird for the interview. I had to borrow my mother's car because mine had been wrecked in the accident. I didn't have a car. I don't remember who interviewed me, but they offered me the position as chief of a survey party, **SP-6,** on the spot. It was what I wanted to do, working outdoors, so they hired me and I gave notice to the Corps of Engineers that I was leaving in two weeks.

And John said, "Golly, Ted, we could have gotten an SP-6 rating for you if we'd known you were on that register. We could have given you a senior engineering aide position. You certainly deserve it. You've been here a year." He was very effusive about it. And I had to say, "Well, you didn't tell me that, and I've already accepted this other job." The other thing, I was going to be surveying, and I was chafing at being in the office, especially in the summertime.

And so I think it was probably around July 1, 1940, I started to work at Edgewood Arsenal for the Constructing Quartermaster, surveying for the chemical warfare depot down in a new area that was opening up. We surveyed for railroad lines and sidings and located phosphorus storage places and other facilities and eventually surveyed all the way down that long peninsula that goes down, I think, between the Gunpowder and the Bush Rivers. I think it was called the Santo Domingo area-land that they had bought up years earlier. There were old decaying farmhouses and dirt roads, and I had to survey some

lines through some swamps, just to layout a traverse and map so they could locate other things down there later.

I really enjoyed that summer. I can't remember that it ever rained. I had to drive 50 miles to get to work-100 miles a day. I was living up in Reisterstown, actually in a little town called Woodensburg north of Reisterstown and driving, picking up people in Baltimore and going out the Philadelphia Road to Edgewood. Again, we were working five and a half days week, so it was six days a week driving up there.

Q: You were talking about being hired on with the Quartermaster Corps and then going to Edgewood Arsenal. Do you want to continue from that point on?

A: Well, we did all that surveying, and I can remember the muck that we surveyed through when we went down that peninsula through some of those swamps-the grass at the upper end of some of the little creeks. It was a messy, messy job. One of my chainmen got sick because of the foul odor, and I had to go in there to finish the job.

This lasted the whole summer of 1940. I put 12,000 miles on my new car in three months driving to and from work and—

Q: Let me ask you a question if I might.

A: Yes.

Q: Now this chemical warfare depot-Edgewood Arsenal-this question is obviously for the benefit of knowing your thoughts about present-day concerns about dumping and toxic pollution and so forth, so when you did this arsenal-

A: Oh, people have just been convicted of improperly disposing of chemical waste up there. The people that were charged.

Q: That's right. Those civilians. You knew that the arsenal was going to be used for chemical warfare experiments and so forth, and there would be, I suppose, a dumping problem. Was there any concern when you were doing the surveying about the dump sites being properly located so there wouldn't be any kind of pollution or anything like that?

A:: No. I didn't give any thought to that. I don't think anyone did at the time. I was a survey party chief and we were laying out a railroad track and warehouses, and the only thing that made us realize that this was dangerous stuff was that we were locating bunkers to store phosphorus in with mounds of earth over them. But the warehouses-I guess I didn't have any perception of exactly what was going to be in them and what was going to be done there. You remember the war was going on over in Europe at the time, but we weren't in it. I didn't really think too much about that. A young man of 21 years old in 1940 had other things on his mind than thinking about environmental consequences of what he was doing. I wasn't 22 until the end of that summer.

So I didn't really think about that, and I'm not sure anybody did. It's pretty obvious that they didn't, even many years later when they really had some dangerous stuff there. If anybody thought about it, they apparently didn't take any action, because the employees there were convicted. I think it was a raw deal for these people, who were doing what they were paid to do, to be convicted. I haven't read any details about it, however.

Anyway, the job got bigger at the end of the summer and the Constructing Quartermaster decided that they needed to have an architect-engineer on the job. I think the firm they hired was probably Whitman, Requardt, and Smith, which was a big Baltimore engineering firm. When they came in they brought in another survey party. Of course, we had all of the locations surveyed and laid out, but they said, "Well, we're going to have to go over and do all of that over again to make sure that it's right." I started to boil inside, because I thought our work was pretty good.

Spillway Design Section, Bureau of Reclamation, Denver, Colorado

When I went home that night I had a letter from the Bureau of Reclamation out in Denver offering me a job as a junior engineer, P-1. That was providential, and although the salary was just the same, $2,000 a year, it seemed like a step up in status. This offer also came as a result of an exam I had taken when I was still in college. It had taken them a year and a half to get around to certifying me for employment as a junior engineer. The Bureau wanted somebody to go out in the field and survey for irrigation projects. The job seemed to be right up my alley.

But the fact that it was getting me back in the water resources field didn't really enter into my decision. However, I had worked on flood control with the Corps and working with water had a lot more appeal than surveying for chemical warfare depots.

So the appeal of working on irrigation, of going out West--I'd never been out West-and also of getting into the professional category made my decision easy, particularly because I was mad over there being somebody else hired, and paid more money than I was getting, and deciding he was going to do my work over. Thus, it didn't take me long to accept that job. And by early October, I was on my way to Denver.

When I got there and reported for work something happened that changed the plan. When I reported for work they said, "Mr. Schad, we're sorry, but your physical exam doesn't permit us to approve you for field work." Of course, I said, "Well, I've been doing field work all summer, doing surveying." They still didn't approve my doing fieldwork, so I took the alternative position they offered in the Spillway Design Section.

So I started to work for the Bureau of Reclamation in October 1940 in the office of the chief engineer. And it turned out to be very interesting work.

When I went out to Denver even though I'd lived away from home down in southern Maryland surveying for the power lines, I felt that I was all alone and a long way from home. In those days, it took the better part of four days to drive from Baltimore to Denver. There were no interstate highways. You drove U.S. Route 30, because that was the only one that was paved all the way. Route 40 had one section in Kansas that was still gravel at that time. Maybe some of the southern routes were paved all the way. I don't know.

So, I took the Lincoln Highway which passed just below Chicago and after crossing Iowa went up the Platte River valley and through Nebraska. At some point west of Ogalalla, Nebraska, I felt a great thrill when I started going up the hill, climbing out of the Platte valley on to the high plains. It just seemed that you went up and up and up and up, as the road leveled and then rose again. And I just felt as if I were going up to heaven, there was such a feeling of exultation. It was so wonderful I still remember the feeling today, 50 years later, driving 80 miles an hour-everybody always drove 80 miles an hour then when you got out of the city-there were no speed limits on the open road.

And sometime-I'm not sure whether it was right when I got to the top of that hill or later, I started to see the faint blue line of the mountains in the distance. Tlhe air was so clear and there was no sign of smog or pollution of any kind. As I drove on down the road that followed up the course of the South Platte toward Denver, the mountains to the west loomed up higher and higher on the horizon and I was in a state of euphoria all the rest of the way.

While I am waxing euphoric about my personal feelings I have to tell you about something that had another tremendous impact on my life. There was a family in Denver that came from my home town of Reisterstown, Maryland. Their name was Ebaugh. Dr. Franklin Ebaugh had grown up on a farm near Reisterstown and had married a girl from Baltimore County. They lived in Denver and he was a very well-known psychiatrist and he was at that time head of the Department of Psychiatry at the University of Colorado Medical School in Denver.

And so because I was feeling kind of alone, I called them up shortly after I got to Denver and Dorothy Ebaugh said, "We'd be delighted to see you. How long are you going to be here?" and I said, "I'm going to work here. I'm starting to work at the Bureau of Reclamation next Monday."

She said, "Well, why don't we drive you up in the mountains tomorrow? I'd love to." I accepted her invitation with alacrity. This was a chance to meet somebody from home. When you're alone, far from home, you want to know somebody. I didn't know anybody at the Bureau yet. I hadn't even been to the office.

So she took me for a drive in the mountains, inviting a friend of hers, Eleanor Eppich Kingery, who just happened to be the secretary of the Colorado Mountain Club. It was a pleasant drive up through the foothills west of Denver to Idaho Springs-and this was before the Clear Creek Highway was built. And then we drove up the Virginia Canyon Road, which was a steep shelf road with zigzags and switchbacks up to a pass and then dropped down into Central City. Affter a short visit to the Teller House to see the "Face on the Barroom Floor" we drove on down through Boulder and back to Denver.

And before I got out of that car, I had to fill out an application blank to join the Colorado Mountain Club. And this, I'm sure, got me out in those mountains a lot sooner than I would have, because if anybody else can remember the fall

of 1940 in Denver, it was beautiful weather, right up through Christmas. I started going on Colorado Mountain Club trips every Sunday. Because the snow had already started in the higher altitudes, the trips were mostly just little hikes in the foothills, scrambling over rocks. But that started me on what became a dominant force in my life-that is mountain climbing. From then on I was hooked, and when the summer came, I was out climbing every weekend. Like many newcomers to Colorado, I fell victim to what we called 14,000-foot fever. We just had to climb all of those mountains that were over 14,000 feet in elevation above sea level. That happens to be 4,237 meters and one of my friends would say, "What's the difference whether a mountain is 4,237 meters or 4,210 meters? Why do you want to climb one and not the other?"

Well, it was just a kind of a feeling that you got. Eventually I teamed up with some of my colleagues in the Bureau of Reclamation and got lots of advice from one of the people that had already climbed all of them, Whitney Borland. He was my squad boss in the spillway section in the Bureau, and we used to talk about mountains. They certainly had a profound influence on our lives and it's probably why I'm in as good health as I am now, and-you realize this is my 50th year-I'm just finishing the 50th year of my professional career.

During the 18 months that I worked in the Spillway Design Section, I became very much interested in hydraulic design and read a number of books on the subject. I worked on design of spillways for dams such as Anderson Ranch Dam in Idaho, Angostura Dam in South Dakota, Rifle Gap Dam on the silt project in western Colorado, and Kortes Dam, which is a power dam on the North Platte River in Wyoming. Those are the ones I remember. There were a lot of others. And I had the opportunity on some of them, like Anderson Ranch, which was already authorized, to make the initial design-being supervised, of course, by others-and then following through with the model testing and perfecting the design. The office of the Bureau was in the Denver Custom House, at 20th and Stout Street then, and the hydraulics lab was in the basement. And I had the thrill of making the initial design of the spillway and observing them make a model test, watching them run the model, and making adjustments to the design and so forth, and it really was a wonderful opportunity for a young man just 22 years old.

I was working under the direction of the head of the Spillway Design Section, D. C. MacConaghy. And he was one of these grand old men with a lot of experience. He was a Scotchman, and for lunch he'd eat a few crackers and

drink a little carton of milk. I thought it was because he had ulcers or something. Later somebody told me that he did it to save money.

Now this is far removed from a career item, but I have to tell you about what happened that fall when we had a golf tournament at the Bureau of Reclamation. Everybody was paired by lot, and my first match was with D. C. MacConaghy, my big boss.

I had played a lot of golf in Baltimore, and after we got out of college and started working, we usually took caddies. I'd only played golf in Denver once, out at the Case Course, so I'd never been on the city park course. I got there first, before Mac arrived, and the first thing I did was engage a caddy. Because, I didn't know the course, and, I just thought, "Well, gosh, the big boss of the whole Spillway Section-I had a couple of squad bosses in between me and him-would certainly use a caddy." He was at least a P-6 in the government hierarchy. But when MacConaghy got there I saw that he had what we used to call a Sunday bag, a light-weight canvas bag that you carried yourself. We went out to the first tee and he looked at the caddy and he looked at me, and he was obviously quite shocked. I felt a little queer and said, "Well, you know, I don't know my way around this course," and I was hoping that there would be an earthquake and the ground would open up and swallow me. But it didn't. So we teed off. I used to hit a fairly long ball, and the course there is flat and hard in the fall. I was hitting these drives about 250 yards and old Mac would come in, and he'd hit a ball that would go straight down the fairway about 150 yards. Then he'd take his second shot and he'd be up to me.

To make the situation worse, I started winning. And we got up to about to the 14th hole or the-1 think it was either the 13th or the 14th hole and I was ahead by something like-1 guess it was on the 14th hole and it was five and four, and Mac said, "Well, that's it," picks up his bag and (Laughter) started to walk back to the car. Of course, I had to go with him. I felt that it really put me off on a bad foot with MacConaghy, and I felt that I would never make it with him. But it turned out that he was pretty rough with everybody. Later, one of the other fellows that had been working in the Spillway Section as a junior engineer for six or eight years, Boyd Brown, and he really was a mature person-at least compared to me-told me that Mac never recommended anyone for a promotion. About that time the Ramspeck Act went through, and I'll never forget Boyd Brown saying, "Well, it takes an act of Congress to get me a $100 raise."

Q: Now, what act was this?

A: The Ramspeck Act in 1940 or 1941 authorized the in-grade raises. At that time it was every 18 months.

Planning Division, Bureau of Reclamation, Pendleton, Oregon

Q: I see.

A: Anyway, so nobody was getting raises out of Mac, but the anecdote shows how inept I was at "winning friends and influencing people."

After I had been in Denver about 18 months I got a call from E. B. Debler- "Old Deb" they used to call him. He was head of the Planning Division in the Bureau of Reclamation. When I went to see him he said, "Well, Mr. Schad," he says, "you know, we wanted you to go work for us, but they wouldn't let us hire you for field work and we did something about it. We've gotten this restriction on your ability to do field work removed and we'd like to have you over here in the Planning Section. "

This really made me feel like I was going to have the chance to do what I really wanted to do: field work. I enjoyed the spillway design work, but the war was on by that time, and I felt as if I were working on projects that couldn't possibly have anything to do with the war effort. I felt like I was spinning my wheels, working in the office, and I wanted to get out. So, it didn't take me long to say goodbye to Mr. MacConaghy and transfer to the Planning Division.

At this time, the Bureau's work was all centralized in Denver. There were no regional offices. I am not even sure that I knew that we had a commissioner. To me, the chief engineer, Mr. Walter, was the head of it all, and I just didn't realize there was a commissioner, John Page, back in Washington. I don't remember finding that out until much later.

Deb gave me the choice of either going out to Oregon and working there on projects under the tutelage of Glenn Sloan or of staying in Denver and working with Randy Riter on hydrology. They knew I'd worked on floods and the Bureau was authorized in 1939 to include flood control in its projects.

I decided to take the job under Glenn Sloan out in Oregon. I wouldn't be working directly with Glenn Sloan, but he was kind of the honcho for all of the Bureau's field planning.

Q: Was Sloan at Billings at this time?

A: Oh, no. Sloan was in Denver. Almost everybody was in Denver. I'm not even sure there was a Billings office. Well, there probably was—

Q: No, Sloan had been working out of the Billings office when he was working on the Pick-Sloan Plan. That's the reason why the Missouri River basin development comes to be called the Pick-Sloan Plan.

A: I know. But that was not until 1944. And he had an office in Denver. I think he did the Pick-Sloan Plan out of the Denver office. The surveys for the Missouri-Souris and the Garrison Division, and the Oahe-James units were what we in the Bureau used to refer to irreverently as "windshield surveys." There was very little field work.

Q: I see.

A: Now, the field office was undoubtedly involved in some way.

Q: I was thinking Bashore was the commissioner.

A: Well, Harry Bashore followed John Page as commissioner. I'd have to check the history books to see when it was. But John Page was in there through the 1930s. Bashore may well have been in there by this time, because it was 1942.

Q: Yeah.

A: Page probably was succeeded about 1940. Anyway, I got my directions from Glenn Sloan after I transferred to the Planning Division.

Q: Can you tell me what kind of man Glenn Sloan was?

A: Well, he was a very kindly person and he really was very helpful to me. Personally, I remember the way one of his eyes was bigger than the other

because it was obvious he had done a lot of squinting through a transit. Somebody told me that's what caused it.

But I didn't really work with him that closely. It was just a couple of meetings before I went out in the field. At the time, I didn't even recognize him as the author of-1 didn't even know they were working on the Missouri River basin plan. You should remember the Pick-Sloan Plan-the Sloan part, the Bureau's plan, Senate Document 191—was rushed in there to get it in before the Corps got its report in, because the Bureau could see the Corps moving into its territory. I'm not sure that Glenn Sloan had started on that job. I mean, it was under his general supervision—all the planning was-and that may be why he was still in Denver and not up in Billings. That's probably the reason we used to joke about how he made windshield surveys of most of those projects that were recommended. You know what that means. You drove through the area, and if you could see some flat land, that was irrigable land. I'd have to look at the date on Senate Document 191 to refresh my memory as to when it was done. [The Bureau's report was dated April 1944.1

Anyway, in April 1942 I went out to Pendleton, Oregon, drove out across Wyoming and Idaho, and I continued to get a thrill out of the great open spaces of the West and seeing places such as the Hagerman Springs along the Snake River in Idaho with all the thousands of springs coming down from in between the lava flows. And finally over the Blue Mountains of eastern Oregon and into Pendleton. I was only there for one day or so, and then they sent me over to Prineville, Oregon, to work on the Crooked River project. It's right in the middle of Oregon. From Prineville we drove up the Crooked River valley to Paulina which was just a crossroads. At that time there was just a general store with a gas pump out front and a post office in the back of the store and maybe two other houses. I stayed with a rancher named Dick Bryant about a half a mile away. We had government cars and we were surveying potential dam and reservoir sites in the valley. We also made a base map for land classification on every place you could find any flat land.

This was for the preliminary report on the Crooked River. It was a basin report, and I worked up there from about mid-April until mid-June. The weather was just terrible. It could rain one day; and the nature of the roads was such that when it rained it was a deep, kind of a gumbo mud that was so muddy your wheels would spin when you started off. And then a few hours after it stopped raining it would all dry up and you would have a thick layer of

dust. It was cold and miserable, and my survey crew-1 was the chief of party-kidded me unmercifully about my interest in climbing mountains. I guess I talked to them about climbing mountains, because right over there to the west of us were the Three Sisters in the Oregon Cascade range. I just looked at those peaks and talked about them, and I wanted to get over there and climb, but it was early spring and you couldn't do it without a well equipped party. Also I didn't feel comfortable about snow and ice.

My rodmen knew that I wanted to climb those mountains, and so they would go out of their way to locate survey points-we were doing plane table and alidade surveys-on some isolated pinnacle where there was hardly room to get around the plane table to take sights. In one place there wasn't even room to take any sights. And they would laugh at my discomfort as I struggled to set up on the little pinnacle. This was in the gorge where we eventually built the Prineville Dam for the Crooked River project.

They were kind of needling me-1 was replacing their much loved former party chief, who had been drafted, and so they probably were testing me to see how much I could take. But I had a lot of fun and I used to write to the woman who eventually became my wife, and she said that the most interesting letters I ever wrote were when I was writing from the Crooked River country because Dick Bryant was such a fascinating character. He was an old rancher and he would serve up dinner and the meat tasted a little bit different, but I didn't really know what it was. And he would say, "This is good beef, isn't it?" and then I finally realized that it was venison. He was not averse, when he needed food, to shooting a deer and having venison for a while.

They were really isolated up there. They had one of these old telephone lines. It was a single wire system, with the return through the ground. When the wire got blown down one time they hooked the remaining section on to somebody's fence wire, and so from then on they called it the barbwire line.

Even though it was isolated, word got around so that they knew when the game warden was coming up. Then they made sure that there wasn't any venison around, or anything like that. It was about 70 miles up the river from Prineville to Paulina, through a little town called Post, dirt road all the way. You could take a short cut over the hill if it wasn't so muddy and rainy that you would have trouble getting over the hill. That would save you about 10 miles.

The valley of the Crooked River was surrounded by the Ochoco National Forest, and we surveyed dam sites up on Big Summit Prairie and Little Summit Prairie, and I was in my element, because here I had my maps to work on and I was studying and figuring out the way to run the canal lines. We could actually get out and drive through the sage brush, and sometimes we'd get big chunks of sage brush caught under the bottom of the Chevrolet cars we were driving. Somebody finally got the idea of welding a steel plate under those cars so you could drive through the sage brush without getting caught.

I was up there until about the middle of June, and the weather was really getting good then, so we finished the field work. Then we had to work in the office. It was ever thus! You worked out in the field when it was rainy and cold and miserable and windy, and then when you get all the field work finished, you have to go in to the office and work up your notes while the weather is good outside.

Green-Puyallup Project

In June I went back to the office in Pendleton until that office closed in September. Then I transferred to Salem, Oregon, and was sent to Puyallup, Washington, which is a little town about 10 miles east of Tacoma, where I was surveying for the Green-Puyallup project. This was to be an irrigation project which would use water from the Green River and the Puyallup River to irrigate some of that fertile valley where they grow good crops but suffer from lack of rainfall in the summer.

All of this was part of what they called the "Food for Victory" program at the Bureau. This was how the Bureau justified this work during the early years of World War II. By this time it was the fall of 1942~and it was thought we were going to have a long war and that we'd need the extra food production before it was over.

People now tend to forget the shortages of food during World War II. Everything was rationed, not just the meat. You had red points for meat and you had blue points for fruit and you had green points for canned vegetables. There were shortages of almost everything, and you did not have much choice in what you bought in the store. There was very little butter. You could buy margarine, but you couldn't buy yellow margarine. They had that mix so when

you bought margarine you had to mix it up with a little packet of yellow dye if you wanted it to look like butter. And for butter, the price was just unbelievably high so that nobody could afford it.

So the Bureau had this Food for Victory program and that's what we were working on with the Green-Puyallup project, which would have been an easy and quick project to build, because they didn't need storage since those rivers flowed all summer there, right out of the Cascades. We surveyed up and down that valley locating irrigable land. We had a hard time getting a survey crew together, and I broke every rule in the book to get the job done. I hired a 72-year-old man and I hired a 14-year-old boy as rodmen. The old man walked so slowly-he was carrying a big 14-foot stadia rod-that you had to look at him twice to see whether he was moving or on station, because he always walked with the rod, holding it up over his shoulder because it was too hard to lift it up if he ever let it get down. I got my knuckles wrapped for hiring the 14-year-old boy because you weren't supposed to hire anybody for the government unless they were 16 years old, but we got out of that all right.

One of the aspects of this was that I was working with the Army engineers in Seattle on the flood control benefits on Green-Puyallup as well as earlier on the Crooked River with staff of the Portland District. One of the things I noticed was here I was, a junior engineer-by that time, my Ramspeck raise had pushed me all the way up to $2,100. And I noticed I was working with Army engineers who were at the **P-2** or **P-3** level, and it just struck me as unfair that I was working with these people at a much lower salary. Also I was very dubious as to the importance of the Food for Victory program.

Specifications Section, Seattle District

Earlier, I had tried to get in the Army Specialist Corps as an officer because they would take people in who had physical impairments. I still walked with a limp because of my right leg being shorter. I had made an application, but nothing came of it. When I just asked somebody casually at the Seattle District if there were any openings, I was asked to send in a resume. That led immediately to an offer of a position doing war work in the Specifications Section. This didn't sound very interesting to me, but the personnel officer said, "We need you. We need you. We're doing war work. We need **you."**

My reply was that I was not interested and went home and eventually returned to my home office in Salem. But the next thing I knew, my boss down at the Bureau, who later became assistant commissioner of the Bureau of Reclamation, called me into his office and told me, "The Corps of Engineers wants you up in Seattle. They want to transfer you."

And I said, "Oh, I talked to them, but I told them I didn't want that job." He said, "It doesn't look like you've got much choice. This is an official transfer, a war service transfer, " and he said, "I don't think you can get out of it." Well, I looked, and the salary was $2,600 a year, assistant engineer, P-2, so I moved up to Seattle and took that job with the Seattle District.

At that time, the Seattle District was handling Alaska and our work extended as far east as Cut Bank and Glasgow and all of the rest of Montana for the military work, and we had a lot of HECP and HEDP, Harbor Entrance Command Posts and Harbor Entrance Defense Posts along the Puget Sound and out along the ocean. I was put in the Specifications Section more or less unwillingly, but it was work that I could do. In many instances, however, we were writing specifications after the projects had been built. And also, we had to follow the guide specifications for military construction which were more or less cut and dried. We also had all kinds of critical material lists that we had to follow. Some of it didn't make much sense.

One of the materials that was very critical during World War II was two-inch dimension lumber. They were using all the two-by-fours and two-by-sixes for crating military equipment that was being shipped-well, both ways, to Europe and to the Pacific theater of war. And so we wrote the specifications to prohibit the use of two-inch dimension lumber, specifying alternatives that they use, such as building barracks out of brick or stone or anything, but positively no two-inch dimension lumber.

When we got out to a construction job once in a great while, we saw what the contractors were doing. They didn't have any trouble with not using two-inch dimension lumber. They just used four-by-fours and four-by-sixes instead of two-by-fours and two-by-sixes.

That was one of the sorry aspects of the wartime economy. They would set some uniform rule in Washington which just was not adaptable to the Pacific

Northwest. There never was a shortage of lumber there, but there was a shortage of brick and building stone.

Eventually I got to be chief of the Specifications Section, after the Anchorage, Alaska, district was formed and my boss transferred up there. Beforethat, and a lot of people have forgotten this, the Japanese had occupied Attu and Kiska Islands out in the Aleutians, and it really was expected that there were going to be a lot of casualties before we could win them back. There were not enough hospital facilities to take care of a large number of casualties. So before we were going to move in on the Japanese on Attu and Kiska, it was decided that we needed some more hospital facilities to handle the casualties. The Corps of Engineers leased the New Richmond Hotel, which was in a rather seedy area of Seattle, down near the railroad station. The name," New Richmond," referred to the fact that it was built around 1910, maybe even earlier than that, but was new compared to most of the rest of Seattle at that time.

I'm not sure whether the Corps leased the hotel or some other part of the Army leased it, but the Corps was given the job of converting this hotel into a hospital. Well, it was really one of the most interesting jobs that I had had because I could actually go down there and look at it with the designers who were designing the electrical layout and the plumbing and the structural work, and then we drew up the specifications for a very specific job, which was much more interesting than turning out specifications for cantonments and other standard facilities which were taken right off the shelf. And, in many cases, the specifications were being written after the project was built, as a record.

So on this job, I had a chance to use some ability, and we wrote the specifications and put it out for bids, and the hotel was made into a hospital with operating rooms and emergency power supply and lead-shielded x-ray rooms and all the things that they put into a hospital in those days. Of course, hospitals were not as complex then as they are now.

It was an interesting job, and we put it out for bids. My recollection is that the job was done for $7.5 million, and it was finished in record time. The whole job was finished within less than a year from the time we started to write the specifications. That was the way the Army engineers did things. When they had complete control of the job they could get it done on time. We had to get waivers for the use of the critical materials involved, but we used the materials we needed and we got the waivers later—

Q: So it was a cost plus fixed fee contract, was it—

A: I don't really remember. It probably was, for something like that, because it was peculiar, but my recollection is the job cost $7.5 million.

Well, a few weeks before it was finished, the Army decided to drive the Japanese out of the Aleutians. I can't remember which island they went to first, but they went to one of them and there wasn't anybody there, and then they went to the other one and they got there just as the Japanese were leaving. So in other words, we occupied those islands, I think without even firing a shot. Again, we were not occupying; we were just retaking our own territory.

So, the hospital wasn't needed, and I wish that was all the waste that we had in the war, but-anyway, you have to be ready, and we were ready. And it was just another example of how the Corps, when you needed to get something done, you could get it done.

But the real fiasco came later. By that time, hotel space in Seattle was at a premium. You just couldn't get a room anywhere, and the hotel owners wanted the New Richmond back. They were given it back, and the Army agreed to put it back into shape as a hotel. I didn't get involved in drawing up the specifications for bringing it back to being a hotel, and I don't know exactly how they did it, but at the very end, it cost $8 million to turn it back into a hotel!

And so I always look on that as being one of the fiascos I have been involved in-it wasn't really my fault it was a fiasco, but it really was one of those things that kind of gives you a little bit of humility to think that so much effort was wasted.

When the war was over, I saw the chance to get back into water resources work. I was aware of the work being done on the Chief Joseph Dam, and the 308 review report on the Columbia River, as I had drawn up the specifications for the foundation drilling of the dam sites.

Rivers and Harbors Reports Section, Seattle, Washington

I asked for a transfer into the River and Harbor Reports Section, and began work there with another old-time Corps hand, George Krutilla who eventually came back to Washington and worked at the Board of Engineers for Rivers and Harbors.

At that time, we were preparing survey report on Grays Harbor. The entrance jetties were originally built in the 1890s and had been rebuilt about 1930. But they had been almost demolished by the Pacific waves, and the peninsula north of the south jetty was washing away. There was a fishing boat harbor just inside the entrance, protected by a sand spit that was in danger of being breached. I had the job of preparing the report on a project that included the jetty rehabilitation and improving the fishing boat harbor. Local interests wanted to dredge the fishing boat harbor and protect it, but it was very obvious to me that the fishing boat harbor was in the wrong place; it was north of the south jetty in a location subject to erosion, and it appeared that the whole peninsula was going to wash away before anything could be done.

In a few days of field study I located what I thought was a better site for the fishing boat harbor inside the bay but south of the jetty where it would be protected. We sent the whole problem back to a group then called the Shore Protection Board that dealt with the shore problems of government projects just as the Beach Erosion Board was dealing with general problems of shore protection. The Shore Protection Board made a report on the problem, and agreed that the fishing harbor shouldn't be in the position it was, north of the south jetty, and that when the jetty was rebuilt it would be even more vulnerable because the sand spit that protected it would be subjected to more erosion as the littoral drift was cut off by the new jetty. The board agreed with the proposed new site for the fishing boat harbor, which-I hate to think of it now-was in a marsh area, which could be easily dredged out. We had to dredge the fishing boat harbor, anyway, and we could have made a fishing boat harbor that would have been only a half a mile farther from the entrance and it would have been on the safe side of the jetty. At that time there was little awareness of the ecological consequences of dredging wetlands.

When our draft report proposing location of the fishing boat harbor got up to the district engineer and he discussed it with the local people, he rejected the Shore Protection Board's advice, and the final report was prepared containing

recommendations to dredge the fishing boat harbor where it was and to rebuild the jetty and put armor rock on the sand spit north of the south jetty to prevent erosion. The project was authorized that way, even though it was a more costly solution, because it was the only way the Corps could obtain the necessary local cooperation. I suppose the project is still there, but I understand they have to dump a lot of eight- and ten-ton boulders in there periodically to try to prevent erosion of the sand spit and destruction of the fishing boat harbor.

Although my proposed solution was rejected, I learned a lot from this experience. First, the importance of working with the local interests from the very beginning of the planning of a proposed project. And then I learned a-well, I won't say a lot-1 learned enough about shore protection and jetties and shore erosion processes to give me a little different water resources background which helped me in later years.

Q: Where do you pick up information on ocean hydrology as distinct from river? In other words, you know, did you take courses at Johns Hopkins that specifically dealt with those kinds of subjects as distinct from—

A: No. The courses that I had at Johns Hopkins, and then particularly in the graduate year, were dealing much more with hydrology of rivers. Riverine hydrology.

Q: Right.

A: And, particularly, flood control on rivers. But what an engineer does when he gets into a new field is start reading, and you go to the library if you don't have your own library, and you start reading about it, and the Corps has in its own files a tremendous amount of background information. In fact, there are some Corps disaster areas in this area. I think it was at Tillamook, Oregon, where the Corps put in jetties to protect the entrance to the harbor which cut off the littoral drift and essentially demolished an area they called the Bay Ocean Peninsula.

We had lots of pictures of that. We read reports on what had happened. The Corps has an institutional memory of these things, and it is not hard to tap into it for information. But the reason that the Seattle district engineer reversed us was that I hadn't worked closely enough with the local sponsors as the new plan was developed. A lot of this happened after I had left the Seattle District.

When I left Seattle, I thought we had the thing all straightened out. We were going to build a new fishing boat harbor. It wasn't going to cost the government as much, but the local people would have to spend more, because they'd have to build new docks and fish handling facilities for loading the fish on trucks to take it to Aberdeen or Hoquiam where it is processed.

It was after I left that the decision was made to change the recommendations-to change the report that I had prepared recommending the new location for the fishing boat harbor. But this was just part of the project. The most expensive part was the jetty, rebuilding the north and the south jetties.

When I worked on this project I found a wealth of literature, and I did read a lot of it. There's a lot of literature on the breakwaters and jetties and sea walls on the Great Lakes. Some of the worst wave action is on Lake Superior, for example, where you have tremendous wave action coupled with the extremes of temperature and freezing. But those jetties on the Pacific Coast go out for miles to keep the bar channels open. I think that the Grays Harbor jetties originally went out maybe as much as 18,000 or 20,000 feet, because they put them out past the ocean bar. The idea is to concentrate the tidal flow so that it scours a channel through the bar that is built up by sediment discharged from the river. There still may be a bar, but it will be out where it's so deep that you can get your 45- or 50-foot draft shipping over it without trouble. And that's why those jetties are so long. But there is tremendous wave action out there in the deep water.

One of the things that was found out from some of the investigations was that the waves had enough force to lift the 8- to 10-ton blocks of sandstone used to built the original jetty in the 1890s, up on top of the trestle used to rebuild the jetty in 1930, which was at an elevation of 15 or 20 feet above mean low water.

Marriage

Q: What made you come to Washington?

A: During World War II it was almost impossible to use any annual leave. By the end of the war since everyone earned 26 days of annual leave each year, I had

built up a tremendous amount of leave. I had been married in 1944 and had never met my wife's family and my wife had never met my family. Her family was in Mississippi, my mother and father were in Florida, and the rest of my family-my brother and sister-were in Maryland.

And so, in the spring of 1946, I asked for, was given, leave to take two months off to go back and visit family by car. By that time, you could drive again-if you could get tires-and so we started out on February 15th to take a trip back to the Southeast and Eastern part of the country.

We had a wonderful trip, down the Pacific Coast and across the southern tier of states. On the first night we stopped at Salem to see the people I had worked with there. My former boss, Buzz Bennett, had transferred back to Washington so I didn't see him, but obtained his address. During the war the Bureau had been reorganized into regions and was expanding, along with the rest of the non military agencies. As we continued our trip we eventually got to Washington, D. C., where I looked up Buzz Bennett.

It was another one of those cases when I walked in the door and Buzz said, "Good to see you, Ted. Gosh, we need you back here, when can you start to work."

Q: (Laughter)

A: And I said, "No, that's not why I came in-1 just came in to see you. How's all the family." After we had a nice visit, he said, "I'll tell you, I really would like you to come back here and work." But I said, "No, I like it out West and I want to get back with the Bureau but I want it to be out in the Pacific Northwest, because I like that and my wife likes it. She's from Mississippi and she thinks she's in Heaven with these cool summers out there."

And he said, "You ought to think about it. It wouldn't be permanent. We just want you back here for two years." Then he told me, "What we've got is a rotation plan and you'd probably have to come back here anyway if you go back to work out in Salem, because we're trying to rotate people around." He went on to say, "Once you get to know the system and how it works, you can pick your spot. Right now, we're thinking about opening up an office in Santa Barbara, and we've got a couple of other places in California, and I think eventually we're going to get into Hawaii."

Buzz was in the Project Planning Division, and he made it sound pretty good. Sure enough, when I got back to Seattle, there was a telegram offering me a job and a promotion to go back. Now, remember, this was right after the war. I always felt that the government employees financed that war by the low salaries they were paid in comparison to those paid in the war industries. I was still just a P-3. The salary had finally been raised to about $3,500, and if I took this job as a P-4 I'd go up to $4,300. Little did I know how much more it was going to cost to live in Washington.

My wife didn't want to come, but I remember telling her, "Well, if we go back there, your family's getting old, mine's getting old, we'll be able to visit them," and that was the argument I used to convince her to give up what she thought was Heaven and come back to Washington-for two years. Much later she said that what happened was I got Potomac fever and I wouldn't go back, but what did happen is every time I was given an opportunity to go back, the Bureau would figure out some way to promote me or give me something more interesting to do here.

FIREBRICK, Project Planning Division, Bureau of Reclamation

So, we came to Washington in May 1946, to work for the Bureau of Reclamation in the Project Planning Division-we called it a branch then, the Branch of Project Planning-and I was given the job of liaison with the Corps of Engineers. Under the Flood Control Act of 1944 and the Rivers and Harbors Act of 1945, the Secretary of the Interior had to comment on every Corps of Engineers report, and vice versa. The Corps, or rather the Secretary of the Army-he was still called Secretary of War then-had to comment on all of the Bureau's reports. This was all coordinated through the Federal Inter-Agency River Basin Commission-we used to call it FIREBRICK-and I became the special assistant to Michael Strauss, the Commissioner of Reclamation, who was the department's representative on the FIREBRICK. He had been Under Secretary of the Interior and he brought the FIREBRICK function with him when he became Commissioner of Reclamation.

So here Michael Strauss was representing the Fish and Wildlife Service and the Park Service and all the other agencies of the department, because he was the departmental representative, and I served as kind of as his executive secretary for this function preparing him for meetings and going to the meetings. Of

course, this got me into a lot more contacts with all of the federal agencies from that time on, not just the Corps but the Department of Agriculture, the Federal Power Commission and-what did they call it-the Federal Security Administration that had the Water Pollution Control office of the Public Health Service. They were never a member, but they were kind of an associate member, and the Department of Commerce eventually became a member. And the other job I had was collecting and collating the department's comments on Federal Power Commission applications for hydroelectric power projects.

Now, when I say I had that job it was because-after a year or so-1 was made chief of the section. I think they called it the Coordination of Plans Section, or something like that, which was responsible for preparing the comments. Later, we set up another section to deal with the environmental questions, and I had that too, and had the pleasure of hiring John Starr, my old boss from the Baltimore District, to come over and work with me on that, because he was very much oriented toward environmental matters. In fact, after he retired from the Corps, he's written environmental columns for the *Sun* paper in Baltimore.

Anyway, he was delighted to come to work with us-1 don't know how I happened to get him to come, but it was right up his alley and I needed somebody and he was a very conscientious and reliable person. He came over, probably around 1949, to handle the environmental work because I really had the two sections, the Coordination of Plans Section and the Environmental Section. By that time we could see the environmental movement building up, and also we already had to form to the Fish and Wildlife Coordination Act and were dealing with the Park Service all the time, so this was a special section set up just for that, and John Starr was a natural for it.

As a matter of fact, we were able to give him a promotion to bring him over. I'm really getting to the nitty-gritty, but that was one of the reasons he came. We gave him a promotion. But John didn't stay long because the Korean War started up, and the Baltimore District needed him, and I think they gave him another promotion to come back. So it was really a good thing all around for John Starr, and I did appreciate him-he was a wonderful person for a young man to start working for. He lifted me out of that drafting business and got me to design work; he started the program with the Johns Hopkins graduate school. And so I always thought I owed an awful lot to John Starr, and he was a wonderful person.

Q: You were the coordinator or liaison specifically between the Board of Reclamation-not the Department of the Interior, just—

A: I was working for the Bureau of Reclamation and so this section was part of the Bureau, but at that time, the Bureau had all of these functions for the whole department because Michael Strauss more or less inherited them-the original tripartite agreement, which was the basis for the FIREBRICK, was signed by John Page for the Bureau of Reclamation, and somebody, probably Specs Wheeler, as the Chief of Engineers, and somebody from the Department of Agriculture, probably Ernie Wiecking .

Q: That was in '39, you're talking about, the tripartite agreement.

A: That's right.

Q: For the Corps-that would have been Julian Schley, I guess, was Chief of Engineers—

A: Well, whoever it was, and the Department of Agriculture. And then, of course, when we brought in the FPC [Federal Power Commission], they called it for a few months, I guess, the cluadripartite agreement.

Q: Yeah.

A: And then eventually it became FIREBRICK.

Q: Of course, they organized FIREBRICK partly, as I recollect, in response to the congressional decision—

A: To abandon the NRPB.

Q: Yeah, and also to not fund the Bureau of the Budget's little shop—

A: That's right.

Q: That was involved—

A: The first thing they did was they terminated NRPB—

Q: Right.

A: -by legislation.

Q: Right.

A: Abel Wolman used to say many times that this is the only time that any agency has ever been terminated by act of Congress. Usually they just let them die, but that doesn't happen very often either.

And so the Bureau of the Budget picked up the function—

Q: Right.

A: -and they put out Executive Order 9384, and Congress refused to fund it—

Q: Right.

A: -and at that point, the quadripartite agreement, that group, was made into the Federal Inter-Agency River Basin Committee, with the position of chairman rotating among the four agencies.

Q: Right.

A: And Michael Strauss was involved in it as the Commissioner of Reclamation, following John Page and Harry Bashore. Michael Strauss came down from being Under Secretary of the Department of the Interior to be commissioner because he thought it would be more fun than being an understudy to Harold Ickes.

Q: Uh-huh.

A: Of course, he stepped into membership on FIREBRICK, and that's how we had all those functions, and we also had a water resources committee in the department that had responsibility for coordinating the views of the other agencies in Interior.

Q: Were you getting involved also with the Soil Conservation Service at this time, or was it strictly Bureau Rec, Corps of Engineers type?

A: No, no. We dealt with Agriculture and, at that time, it was a fellow named Ernie Weicking and he was what they called land use coordinator, and Howard Cook was on his staff—

Q: Right.

A: And Nat Back was with him.

Q: Right.

A: Of course, these people all were in the group we dealt with in Agriculture, along with Dick Hertzler who eventually became special assistant to the Assistant Secretary of the Army. We threw bricks back and forth at each other in the form of letters. Michael Strauss was a very strong character. He really was one of the most unforgettable people I ever worked with. At one time, when the House of Representatives was controlled by the Republicans, the Congress passed a law that said, "No part of this appropriation for the Bureau of Reclamation shall be used to pay any commissioner or any regional director who is not a registered engineer or a professional engineer." And this had the effect of terminating Michael Strauss' salary and Richard Boke's salary. Boke was the director of the Bureau's Region 2 in Sacramento. And that, I think, was done pretty much by Senator [William F.] Knowland of California, who was furious with the Bureau because it was trying to get reimbursement for the irrigation allocation of the Pine Flat project. The Corps had built Pine Flat and the Bureau insisted, under the 1944 Flood Control Act, that the sale of irrigation water had to be handled by the Secretary of the Interior, or the Bureau of Reclamation.

And so that fight was brewing, and Senator Knowland wrote a book called *They Would Rule the Valley,* excoriating the Bureau of Reclamation. He thought it was a grab of power, and so this was the response agreed to by the chairman of the House Appropriations Committee that year. And Mike just laughed and kept on working, and eventually became chairman of FIREBRICK. Of course, that gave me an awful lot more exposure to all of the agency people because I was his secretary and wrote the minutes, and handled other functions like that.

Q: Well, can you sort of capsulize the relationship between the Bureau of Reclamation and both the Corps of Engineers and the Soil Conservation Service at this time?

A: It wasn't so much the Soil Conservation Service that we dealt with; this was still the Harry Truman administration, and the fight was with the land use coordinator in the office of the Secretary of Agriculture. We threw rocks back and forth at each other. Agriculture was commenting on our reports, and they would tear them apart mostly on the grounds that we didn't need the production and they would quibble with the farm budgets and all the technical things like that, and Michael Strauss would answer them, and it was just like a slugging match, and I was the one who was writing the letters for Mike Strauss. I'll never forget going into his office one time with a draft of a letter back to the Secretary of Agriculture-I believe it may have been on the Colorado River basin report, which was really little more than a windshield survey, but the Bureau had been working on some of the projects for years. They had a lot of projects in the basin plan, including some of the projects I'd worked on when I was in Denver like the Rifle Gap Dam and a lot of others in western Colorado. Agriculture just tore it to pieces, and we were arguing back to them point by point. After Mike Strauss had read my draft of his response he said, "Ted, How can you write a nasty letter like that without using words like 'son of a bitch' or 'bastard' at all. It's all so polite, and yet-" Anyway, he appreciated that kind of stuff, and I took that as a compliment, because, you know, you work for an outfit and-whether you think that they're right or wrong-you express agency policy.

Now, with the Corps, it was kind of different-we were much more restrained. This was in the days when George Beard was chief of Planning or whatever the Corps called it at that time. George was definitely one of the most able people that the Corps has ever had, and he and my boss in the Planning Branch, Jack Dixon usually met face-to-face to discuss reports. Jack Dixon was an old Corps hand out of the Rock Island District.

And I had to sit in so many meetings and see George Beard talk rings around Jack Dixon and just get him completely walled in-this happened most frequently in meetings of the Subcommittee on Benefits and Costs, and—

Q: That was under the FIREBRICK?

A: Yes, the FIREBRICK actually got out the "Green Book," the first Green Book.

George was a tough man to deal with-we had a lot of meetings with George, and also with Joe Brennan. Joe Brennan was in the corresponding position to me. He was chief of reports-this was before he went up on the Hill to be on the staff of the House Public Works Committee. He was chief of reports and Ken Bousquet was the budget man for the Corps at that time. We didn't have too much to do with Bousquet because we were not working on budgets, but we used to call them the "Three Bs." And we had a great deal of respect for them.

Gene Weber kind of came along after that, and took over, but I can't remember just when that happened. But those were the people we worked with on the Corps' staff. We had clashes on projects like the middle Rio Grande in New Mexico. I think the Bureau may have wanted to build Abiquiu and the Corps was moving in on it too. I think the Corps eventually built it. There were some other clashes on the middle Rio Grande, as we tried to coordinate the work of the Bureau and the Corps. Now, this is just me talking, and the way I remember it is that we went into meetings, with George Beard representing the Corps and Jack Dixon representing the Bureau, and George always just somehow seemed to close in on Jack Dixon and win the argument, and I'd be sitting there and feeling that it wasn't right to interrupt and correct your boss-or at least, it wasn't the proper thing to do. At that stage, I was probably a little more inhibited than I am now-but, the Corps would usually win the arguments because of George Beard. I thought he was just terrific; I have the greatest respect for him.

We had some of the same arguments on the Missouri basin. Now, if you can remember, the Missouri Basin project was approved in the '44 act and the initial stages were authorized, and I think they were as specified in the report, the initial stages.

Of course, this included the main stem dams for the Corps, but it was not as specific on the Bureau. So when the balance of the comprehensive plan was up for authorization in the 1946 act, George Beard argued that the Garrison Diversion into the Dakotas was authorized to the Corps. It was the only time we ever won an argument with George Beard, when he agreed that it should be a Bureau project. Maybe he just used it as a bargaining chip that he was prepared to yield on or maybe he knew that it wasn't a viable project.

I used to go up to the congressional hearings, not so much to testify as to observe. In fact, the first week I was in Washington I was asked to go up to one of the hearings of the Senate Committee on Commerce on the 1946 act-so I could report when my boss, Jack Dixon, or Mike Strauss came up and tell them what the situation was. I remember that I was almost brand new in the office and I guess I looked a little bit shocked at going up on the Hill. And Jack asked me, "You don't mind going, do you?" And I said, **"No."** I really was delighted, but a little bit apprehensive—

-And even more apprehensive when I saw Senator [John] Overton practically take the skin off the representative of the Fish and Wildlife Service who was opposing the Red River Waterway on the grounds that it was going to destroy the fish and wildlife, and Senator Overton-he was somewhat like Mike Strauss, the same kind of a big man, tanned-I guess you might call it a bourbon tan-but anyway, he says, "Now, what about these catfish in the Red River? What are you worried about?" And no matter what the Fish and Wildlife Service man said, it seemed like he would say something and Overton would take another chunk of his skin off.

And then later the Corps decided to call that the Overton-Red River Waterway. I don't know whether that's still the name of it or not.

Valley Gravity Project

Q: Yep.

A: But anyway, that was where I fitted into the picture when I got back to Washington. It did give me a lot of exposure to a lot of people, and I guess I learned a lot, because I was always the person that ended up holding the sack when we'd sit in on some big meeting and I'd have to write up the conclusions. The first time it happened was on the Valley Gravity project in south Texas. The Mexican Treaty provided that a dam would be built on the Rio Grande to provide water for the lands irrigated downstream on the American side, the problem being that, even though you have a treaty dividing up the water, the Mexicans may not necessarily pay attention to it, and the water might not be there when it got down to the lower part of the river.

So the Bureau of Reclamation always called this the Valley Gravity project, and the law implementing the treaty required that the Bureau of Reclamation fund this project and obtain a repayment contract. At an early stage in my tenure at the Bureau of Reclamation, we had this big meeting with the Department of State and the International Boundary and Water Commission and people from Texas and others, and it was more or less demanded by the Bureau of the Budget that the Bureau of Reclamation should be getting a project together to implement this law and get some reimbursement for that dam.

And so we sat around with all these State Department types and all the highfalutin assistant secretaries, and I was there for the Coordination of Plans Section supporting Jack Dixon. After we talked and talked all day and didn't get anywhere, Jack Dixon turned to me and he said, "Ted, will you write up the memo on this about what we concluded?" (Laughter)

A: I went back and I guess I wrote up what we should have concluded, and it seemed to work, because I seemed to be put in that role an awful lot. We had those meetings every year on the Valley Gravity project. We kept on and on and on arguing about it, but we never did get any reimbursement because the Bureau didn't build the gravity canal. The International Boundary and Water Commission built the dam and they eventually called it Falcon. It was a somewhat different project. But the whole idea of our meetings was to see that the U.S. would get its share of the water before the Mexicans took it.

Q: During this time, you had this controversy, usually called the upstream/downstream controversy, and in my own mind, I think of it mostly in terms of a controversy between the Soil Conservation Service [SCS] and the Corps of Engineers, particularly as it relates to the Arkansas River, but it sounds like the SCS might have as much to say about Bureau of Reclamation projects—

A: Oh, yes-

Q: -as about the Corps projects.

Belle Fourche Project

A: Yes, we got involved with them more on the Western projects-I guess it may have been the Belle Fourche project in western South Dakota primarily. Studies that were made by the Geological Survey showed that after the Bureau of Reclamation built that project, there wasn't enough water to fill the dam because the Soil Conservation Service built a lot of small dams that evaporated a lot of water.

We had some arguments with the Soil Conservation Service over that project,-that's the only one that I remember specifically-but we still dealt with them through Ernie Wiecking's shop, rather than directly with the SCS. In other words, the secretary's office handled the interdepartmental fights. With Ernie Wiecking and Howard Cook and Nat Back, they had a strong team. The one person that always was there from the Soil Conservation Service was Carl Brown. He was also on the Subcommittee on Benefits and Costs at FIREBRICK and there were a lot of arguments there on the economics of the SCS program.

But I was not the principal protagonist on that. Jack Dixon was the department's member on that, and then later, Reginald Price-both of them are deceased now. So I didn't get too much involved with the economics of the Soil Conservation Service program. I did work much more closely with the Corps, and I guess somehow had a lot more rapport with the **Corps** because I knew most of the people, and they knew I had come from the Corps, and I knew how the Corps operated.

And the Bureau wasn't nearly as much involved in that upstream/downstream controversy as the Corps and the SCS.

At some point the Fish and Wildlife Service and the National Parks Service got tired of working with FIREBRICK through Michael Strauss. One of the reasons was that there were more conflicts between the agencies. After the Upper Colorado River Basin Compact was approved in the early '50s, which opened up the possibility of building dams on the upper Colorado River, the Bureau of Reclamation went right ahead with a proposed 10-dam project including Echo Park Dam in the Dinosaur National Monument. I had the job of negotiating that with the Park Service. At first, the Park Service was perfectly content, if we gave them $24 million, to build up the dinosaur display area-you see,

Dinosaur National Monument was created years ago because of this quarry, and then Franklin Roosevelt extended it to take in the canyon of the—

Q: Green River.

A: -Green River and Yampa River, where they joined there, two beautiful canyons. The Reclamation Bureau was going ahead with building the dam because they had a reservation for a reservoir dating back to 1910, or something like that, just as they had on the Bridge Canyon site in the Grand Canyon, and just as they had on Glacier View up on the north fork of the Flathead River in Montana. These were all first form reclamation withdrawals. In other words, the land was withdrawn from public use for later construction of a reservoir. When the Dinosaur Monument was enlarged, the Bureau said it had no objection to enlarging it, but just remember that we've got this reclamation withdrawal and reserve the right to build a dam there whenever we're ready.

Connie Wirth was director of the National Park Service at that time and he recognized that he had no legal grounds to object to the building of the dam which was provided for in the executive order enlarging the monument. The Park Service always struggled to get money, and the promise of $24 million to build up facilities to display the dinosaur quarry, which was the primary focus of interest there, Wirth thought was a good deal, so he signed off on the project in the Truman administration. It was not done without some fight and haggling and negotiation, and there were some other recreational facilities in the Colorado River basin plan too. At that time, the project also included, I think, Marble Canyon Dam and Bridge Canyon Dam, upstream and downstream from the Grand Canyon National Park. That was all part of what they now call the Colorado River Storage project, the idea being to provide storage to permit the upper basin to make use of the 7.5 million acre feet that was allocated to the upper basin in the 1924 compact.

So-but I can't remember exactly when, or how it came about-it was decided that it wasn't right for one bureau chief to be representing the department on this. The other thing that happened was that Bill Warne, who had been assistant commissioner of Reclamation, became an Assistant Secretary of the Department of the Interior after the Hoover Commission made its recommendations for adding more assistant secretaries. One of the things about the Hoover Commission reports was that when they recommended that you add

something new, the recommendation was accepted, but when they recommended that you take something off or combine, the recommendation was rejected or put aside for further study.

The first Hoover Commission decided that every department should have an administrative assistant secretary and should have assistant secretaries with complete power to operate in their field. So Bill Warne was made the first Assistant Secretary for Water and Power in the department, and he had responsibility for the Bureau of Reclamation and the power agencies, like Bonneville and Southwestern Power Administration.

Bill Wame may have been the one that instigated the move of the chairmanship of FIREBRICK from the Commissioner of Reclamation to the assistant secretary level. I'm not sure it made the Fish and Wildlife Service any happier. They had the same problem with getting their views represented because Bill Warne was primarily a water man, too, although he had been a newspaper editor-both of them had been newspapermen, Bill Warne from California and Mike Strauss from Chicago.

There was a continual power struggle between Bill Warne and Mike Strauss, and the transfer of FIREBRICK was one of the ways in which it was resolved in Bill Warne's favor. I admired and worked a lot with Bill Warne, too, and almost got caught in a struggle between them one time, because Bill Warne decided he wanted me to come up to work for him in the department. I had been the liaison man for the Bureau of Reclamation, on the departmental water resources committee. When an elderly-I call him an elderly gentlemen; he was not as old then as I am now-W. G. Hoyt, the executive secretary of that group, decided to retire, Bill decided he wanted me to take that job.

Bill had a personnel man in his office who spoke to me about it. It would have been a promotion for me, so I expressed interest. I can't remember the man's name, but he said he would go ahead and take steps to transfer me to the assistant secretary's office.

I assumed that he would take appropriate steps and tell Mike and my immediate supervisor, which is the way such transfers are normally handled through channels. If the Secretary of the Army wanted you on his staff, I would expect them to come back down through the Chief of Engineers and the Chief

Historian of the Army. You know how it is done. In other words, that's the protocol in the government.

Well, this man didn't do that. He just prepared the papers transferring me up to Bill Warne's office in the department at an increase in grade and on a certain day and carried them directly to me and told me where to report. It was essentially an order ordering me to go to work up there. I showed it to Jack Dixon, and he took it to Mike Strauss. Mike called me in to his office and he says, "Do you want to go up there and work?"

Well, it was with some misgivings that I was going to go up there, because I would be getting more into the political side of things, working directly for a political appointee. But I said to Mike, "Well, I'd be doing essentially the same thing I've been doing for you all these years, the function that's been taken away from us. So I know I can do the work, and they're going to give me a promotion."

And Mike says, "Is that where you want to go?" I guess I hemmed and hawed a little and finally said that I couldn't afford to turn down a promotion. Then Mike called the director of personnel of the Bureau of Reclamation over to his office to talk about what he should do about this, because I was just one of a number of people that Bill Warne had taken up to the department when he set up this new office. And Mike was seeing a lot of his best people being taken away.

So he turned to the director of personnel, Glen Thompson, and he said, "I want you to promote Schad tomorrow so that I can write back to Bill Warne and tell him that Schad is already at the grade level you are offering him and he was only going to take the job because it was a promotion."

Well, I don't know whether that's something you ought to tell about yourself. It makes me seem so mercenary, but anyway, that's what happened. I was watching Glen Thompson and he just kind of turned white-almost I thought he was going to faint right then and there. He started to say something and stuttered and stammered a little, and it was obvious that he didn't know what the hell to do. You know, what would happen if somebody said, "I want Marty Reuss promoted tomorrow." There's a lot of paperwork and someone would surely say that it couldn't be done.

But we had a little fellow as our administrative assistant in the Branch of Project Planning. His name was Cleo F. Layton. And he was one of these people who knew how to get things done. He wrote up the papers, and because I had not been in grade for a year he had to get the approval of the Civil Service Commission. This was probably a promotion from P-6 to P-7 and I hadn't been a P-6 very long. You were supposed to be a year in grade before you were given a grade promotion.

Cleo Layton knew everybody, and so, in two hours he walked the papers through the Department of the Interior and the next morning he walked the papers through the Civil Service Commission-which wasn't right next door to the Department of the Interior at the time; it was another building. I used to do a lot of walking papers through the department too. That's one way I got things done. I don't think anybody does it any more. That's why it takes so long to get things done.

And so by the next afternoon, Mike Strauss wrote a blistering memo back to Bill Warne saying that he wasn't going to release me, and that there wasn't any advantage in me going, and then he blistered him for not going through channels. Mike was better at writing memos than I was. Eventually, however, Bill got another person from the Bureau, Morgan Dubrow, to take that job and handle the coordination of the department's views on Federal Power Commission applications.

And really, when you get down to it, there's no reason the Bureau should have been doing that, but it had done that way only because the commissioner was the representative on the FIREBRICK.

But I still was having a lot of fun doing other things. We tangled with the Corps on Hells Canyon Dam on the Snake River. I was sent out to Boise on a rush job to get the Hells Canyon report in before the Corps got its 308 review report completed. The planning had been finished by regional staff but I was kind of the facilitator to speed up the completion of the report. We also worked all night one time to get our Columbia basin report up to the Congress ahead of the Corps' report. It was at the time of the big flood, the Vanport Flood? That must have been about 1948, wasn't it? Do you remember that—

Columbia Basin Report

Q: I think the actual report was about '49.

A: Okay. So the Vanport Flood was about '48, and before the water went down, the Bureau was rushing its Columbia basin report to get it ready, and we got our report up to the-either to the Congress or the Bureau of the Budget-before the Corps did.

Q: Uh-huh.

A: And we did that by working all night, and I'll never forget this. Those were the days when you had to type things twice to get enough carbon copies. You know, they did have-what did they call that brown stuff—

Q: Yeah—

A: Thermofax.

Q: Oh, Thermofax, right.

A: That's the first copying machine-and the copies didn't look like anything. They were brown and they faded. Jack Dixon had a secretary named Mrs. Dalton, and after we hammered out the decisions on the Columbia Basin project, she typed the secretary's covering letter which must have been at least 10 pages long,-first there was a commissioner's report to the secretary, which was already in. Then the secretary's report to the President, and the Congress,-or maybe just to the President. Once we got that out, we could release the report.

We had a lot of meetings and hammered out the decisions. Jebbie Davidson was the assistant secretary that really was insisting on a postage stamp power rate over the whole Columbia basin. The Bureau reluctantly gave in on that. We didn't particularly believe in the postage stamp rate, and would have preferred a higher power rate in Idaho to provide a greater subsidy to irrigation, but we gave in just to get the report finished before the Corps did. We finally got everything finished and the long letter was typed and we were putting our surnames on the file copy. They had a block on the side of the file

copy and everybody put their surname to show approval. Sometimes it was all the way down the side and around the bottom--15 or 20 people.

About 4:30 or 5:00 A.M., everyone was about ready to go home, but we had to have another run of the long letter so we would have enough copies. Mrs. Dalton was typing it, and Jack Dixon turned to me and said, "Oh, Ted, would you mind taking Mrs. Dalton home when she finishes typing that other copy?" Of course, I said, "Yes." And then he said, "Thank you, Ted, and by the way. You always come in early. Don't you come in at quarter to eight?" And I said, "Well, usually. "

And he said, "Would you, first thing then, take this letter down to Secretary Davidson's office and get him to surname it and then get it into the secretary's office before 9:00 A.M.?" Here it was obvious I wasn't going to get away from that place until about 6:00 A.M., and then he expected me to come in before 8:00. I don't think I made it that morning. But it was a fact that the office hours started at 7:45 A.M. and we worked until 4: 15, but I was usually there until 5:30 or 6:00 P.M.

Q: Let me see if we can go back and pick up a few things, because you are saying some things that I think I understand, and I think a lot of readers of this transcript might understand, but on the other hand, there are going to be those who need to be filled in on a few details.

So what you're talking about, of course, is a conflict that existed between the Corps of Engineers and the Bureau of Reclamation, particularly focusing on Western water development. Can you explain what was the nature of the conflict, specifically in relationship to Hells Canyon? Why did the Bureau of Reclamation feel it urgent to get the report in before the Corps?

Chief Joseph Dam

A: Well, let me go back a little bit earlier than that to one of the first ones that came up, I think in 1946, and that was Chief Joseph Dam on the Columbia River. Now, the Bureau had built Grand Coulee but was just getting started on the irrigation part of the Columbia Basin project, and the Bureau was using the power revenues to subsidize irrigation development. You could never build any of those expensive irrigation projects without power revenues to subsidize

them. And the Corps came in to Congress and got a resolution to authorize a survey report on Chief Joseph. When you really look at Chief Joseph, you wonder why would the Corps be building Chief Joseph? There is no flood control or navigation benefit. It is a run-of-the-river power plant that serves almost as an after-bay for the Grand Coulee power plant, and the two plants have got to be operated together. It is a much different type of project than Bonneville, which the Corps built first, and that's hundreds of miles away and is required for navigation.

In 1946 the Corps came in with a report proposing to build Chief Joseph Dam. The Bureau saw that the Corps was picking off a prime power site, the after-bay for Grand Coulee. The Bureau wanted to use that site, wanted to pump out of it for some irrigation projects using the power from Chief Joseph, just it was using the power from Grand Coulee to pump up to the Columbia River plateau for the Columbia Basin project.

So the Bureau saw that the Corps was barging in here with Chief Joseph. So we had a major fight.

Of course, the Corps had its report ready first. The Bureau hadn't even investigated Chief Joseph. There was never any question of that. But the argument we developed for our spokesman at the hearings on the project, Warner Gardner, the solicitor of the department, was, "We're not playing a game of football, gentlemen, so that the one who gets the ball first runs with it. This is a serious decision that should be based on all of the facts," and he explained all these reasons why this should be a Bureau project and you shouldn't have another agency building the after-bay for a major power project. And we drew up a big colored map showing the Chief Joseph Dam in red in the middle of the Bureau's projects.

The position the Bureau was taking was that this was an invasion into the federal reclamation program. At that time, there was no way you could use revenues from a Corps' project to subsidize a Bureau's project. There wasn't any basin account at that time.

That was the initial postwar fight continuing the struggle over projects that erupted over the Pine Flat Dam before the war. The Bureau lost again. It was in the '46 act, I think, that Chief Joseph was authorized.

Of course, the Corps was authorized to study Chief Joseph by a resolution to review the 308 report and see if a dam should be built there, but I don't really know--I'd have to check up on why the Corps was proposing to build Chief Joseph. I really don't know why because it's just purely a power project.

Q: Of course, the original 308 report-

A: -had all those projects in-

Q: -had all those including Coulee-

A: -including Grand Coulee.

Q: That's right.

A: Well, and just like the original 308 report on the Tennessee got the whole TVA [Tennessee Valley Authority] system laid out,-but the Corps didn't build all of those projects. They didn't build them just because they get in there first. Resource development isn't playing football.

Q: Yes.

A: So that was the point that the Department of the Interior made and that the Bureau of Reclamation was making—

Q: Well, what—

A: -and so it was a continuation of that struggle based on bureaucratic power politics. The agency that builds a project has a lot of money to spend and a lot of people to hire and a lot of power. The argument on Hells Canyon was about the same between the Corps and the Bureau. The Bureau had been working in the Snake River basin since 1902. The Minidoka project was one of the first reclamation projects. Then there is the Boise project, and the Vale project-those are some of the original reclamation projects. In recent years the Bureau continued to work in Idaho and they built Anderson Ranch Dam and they built Palisades. Then the Corps came in and wanted to build Lucky Peak for flood control, and this was right in the middle of the Boise project. But there wasn't any irrigation; it was a flood control dam, but it had to be operated in coordination with the Bureau's projects.

I can remember working one Saturday to make a big map showing all the Bureau's projects in nice shades of blue and yellow and green, and the Lucky Peak project in red right in the middle. The Bureau was trying to take Lucky Peak away from the Corps, but it didn't work.

On Hells Canyon, the particular thing that the Bureau wanted was the revenues, the power revenues, to subsidize irrigation. In the upper Snake basin-everybody agreed that, in spite of Lucky Peak, it was primarily reclamation territory. In the lower basin, the lower Snake dams and McNary and John Day was navigation territory-the Bureau never had any problem with McNary and John Day and The Dalles. Of course, Bonneville was in there first, and Priest Rapids was built by somebody else.

Q: Yeah, by private.

A: No, it was built by a public utility district, but Rocky Reach was private.

Q: Right.

A: So Hells Canyon could have logically gone either way. It was in between. But what the fight was all about was who's going to get to build these dams as a matter of bureaucratic aggrandizement, but also it was the power revenues that the Bureau wanted. And then also, this was not the Bureau so much as it was the department under Secretary [Julius] Krug and under Secretary Oscar Chapman. The driving force was Assistant Secretary Jebbie C. Davidson, Gerard Davidson, who wanted to extend the Bonneville Power rate into Idaho, and Hells Canyon was the key instrument to do that. Power from a big generating plant like Hells Canyon would have to move both ways. Idaho is closest.

You're going to move a lot of power into Idaho, but some would go the other way, to the lower basin, and this would provide transmission lines that would provide a way to extend the Bonneville power rate which, if you remember, was 2 mills per kilowatt hour for firm power. Jebbie Davidson wanted to extend that rate up through Idaho which would have carried the benefits of public power all up through the Idaho Power Company territory.

In other words, this was the same thing that came up in our discussions of the history of the Flood Control Act down in New Orleans. Certain people were

trying to use the Flood Control Act as a means of getting federal hydroelectric power-Morris Cook and others-and, as your historian friends say, there was a hidden agenda there in the first Flood Control Act to keep that from happening. Well, whether there was or not, I don't know.

But it was not so much in the 1936 Flood Control Act but in the '38 act, when they changed the policy on dams—

Q: Right.

A: -so that you could build power.

Anyway, that was the gist of the fight between the Corps and the Bureau but when I went out to Boise in early 1948 to finish the Hells Canyon report, we were also fighting to get it done because Idaho Power Company had filed an application with the FPC to build five small run-of-the-river plants in that same reach of the river, which would have completely lost any flood control benefit, as well as kept either the Corps or the Bureau out of there, and there would be no navigation benefit of any kind.

Eventually, then, we negotiated an agreement with the Corps of Engineers on the Columbia River basin, which gave Hells Canyon to the Bureau. We got the report finished and sent it on up to the Congress. Authorizing legislation was introduced and there were hearings on it. Wayne Morse gave speech after speech on the Senate floor which we wrote for him. He would make those speeches late in the evening, and he'd go on for hours sometime. We'd write 50- and 60- and 70-page speeches for him to give-all the background on Hells Canyon, as to why the federal project was needed. I really think that that is one project that should have been built, because of its role in flood control, and the minimal adverse effect on the environment that would result.

Fortunately, we haven't had a big flood come out of the Snake River in recent years. I don't know what happened when the water from the Teton Dam failure came down the Snake. By the time it got down there, I guess the flood was pretty well attenuated. But if you ever have a repetition of those floods where the Snake peaks at the same time as the upper Columbia River-you could have a lot more damage, all the way down to Portland.

Anyway, I think Hells Canyon would have been a good project and it would have had no different environmental effects than the three small dams that the Idaho Power Company finally built. It would have taken the same land, except the pool would go on a little bit farther up the canyon, but it would have had no different effect. In fact, it was easier on the fish. There was only one place, if you wanted to run fish up above it, only one dam instead of three. But no salmon go up that far any more, I don't think.

But the whole picture was obfuscated by the fact that there was another dam site down in the canyon, Nez Perce, which would have blocked the Salmon River, and so the environmentalists attacked the Bureau's plan, arguing that the Hells Canyon was just the first step toward flooding the entire canyon. Actually Nez Perce wasn't in the Bureau's plan at all; it was a Corps proposal. Once you had Hells Canyon Dam, the Bureau didn't need to build anything else on the Snake River. And when the Corps got into the fight over Nez Perce, they found another site, which they called Mountain Sheep, which was above the Salmon River. But that's another story that I was not involved in. I was at one time going to write a book about my experience with the Hells Canyon project, and I kept all kinds of notes but, as the issue fades away, you don't get around to doing half the things that you want to do.

Q: A fair amount's been written about it, of course.

A: Well, lots has been written about it, that's right.

Q: Yeah.

A: And a lot of it has been inaccurate. Very few people know the whole background.

Q: Uh-huh.

A: That's one of the things I found out when I got over to the Bureau of the Budget in 1954, one year after Dwight Eisenhower came in and I saw the papers that had been used for the cabinet meeting where the decision was made to pull out of federal sponsorship of Hells Canyon, I found that they were inaccurate. I don't remember exactly the details, but when I looked at it, and I was horrified because the decision was made in the absence of having all the facts about those projects. Of course, it was an ideological decision-part of the

effort to get the federal government out of the power business. The thing that really killed the Hells Canyon project was Jebbie Davidson's insistence that you use it to extend the Bonneville power rate into Idaho, where there would have been great benefits with the development of the phosphates industry.

Q: I know what you're talking about.

A: Using low-cost power to develop a chemical fertilizer industry up there, Simplot-

Q: I know Simplot, yeah. It made its fortune during World War II, as I recall, selling—

A: That's right.

Q: Yeah.

A: And Simplot was all for it, because he'd get cheaper power. Idaho Power Company was actually signed up on Hells Canyon when the Bureau wrote its first report, which was going to divide the power market-4.4 mill rate in the upper Snake basin-and 2 mills for the power sold down in the lower Columbia basin. That was kind of peculiar to price power at different rates that way, but it made sense politically.

But when Idaho Power Company saw this change, which was worked out late one night in Jebbie Davidson's office in the Department of the Interior, well, that's when the Idaho Power Company dropped off the support list for Hells Canyon. Of course, that, plus the decision made in the Eisenhower administration to withdraw the federal project, doomed Hells Canyon as a federal project.

Q: Were there any overtones in this whole thing about private versus public power and the intrusion of the federal government into state and private affairs, any of that sort of thing? In other words, this is taking place against a background where we have got the McCarthy hearings and all this sort of stuff. Was it-any of that, those polemics, ever applied to—

A: Well, on Hells Canyon that was the position that Idaho Power Company was taking. Of course, the Idaho Power Company dominated Idaho politics for a

long time. Henry Dworshak was their conservative senator before Frank Church was elected.

Q: Uh-huh. Well, Senator Dworshak you're talking about. He was with Idaho Power? I didn't know that.

A: No, he wasn't with them, but he supported their position on the Hells Canyon fight.

Q: I see.

A: So it was definitely a pubic versus private power fight. And Idaho basically kind of resisted federal power-they wanted to have the Bureau build irrigation projects and subsidize the projects but they didn't want to have any federal hydroelectric power; the general tenor of people in Idaho was against, public power. The support for Hells Canyon came from the Simplots and the people that could see a chance to make some money and to put some pressure on the Idaho Power Company to get concessions on power rates and the irrigation pumpers. They were the ones that supported Hells Canyon, and the municipal electrics and the REA cooperatives. The preponderance of the testimony in the congressional hearings was favorable to the project.

But when Eisenhower came in, there was the feeling that the federal government had gotten too big. The same as, or similar to what Ronald Reagan said. But it was much less intensive, and I don't think that it ever got to the stage that the McCarthy hearings did-they were much more on the overall political issue of communists influencing the government.

Now, Senator Knowland, when he wrote his book, *They Would Rule the Valley*,—that was where the issue of communism or socialism showed up much more-in California. But I don't think he was very sincere about it-he didn't have any problem with the Corps of Engineers building Pine Flat Dam or anybody building a dam that made water available, as long as you didn't make the water users pay for it. There wasn't any problem about the government building dams. It was just the idea of trying to make these people pay, and the people had an argument with the Bureau.

They said, "We've been pumping this water all the time. We're pumping now-and you're going to sell us water? We don't want it. We shouldn't have

to pay for it. All you're doing is trying to sell us what's already ours." That was their argument, long before Eisenhower was elected, really-that the Bureau was trying to dominate California. In my view it wasn't that the Bureau wanted to dominate California, the Bureau just wanted to build more projects and to have an integrated system. Remember, whichever agency builds the dam keeps on operating it when it is finished.

But I've never felt that the Corps really would have built a lot of these dams if it hadn't been for the Bureau of Reclamation. And vice-versa-in other words, the fight was shared by both side.

Q: The Bureau suggested projects so the Corps wanted to build them, and the Corps suggested projects so the Bureau automatically wanted to build them, something of that sort?

A: No, it was more that the local water users wanted the Corps to build the projects so they wouldn't have to pay for the water and the Bureau wanted to build them to uphold the integrity of the federal reclamation laws. The Bureau thought it was the dominant Western water agency. The Corps of Engineers thought, on the basis of history, that it was the dominant United States water agency, and they clashed in the West.

Now, remember the Section 308 language exempted the Colorado River, specifically saying that this is not to be covered because the Bureau of Reclamation has responsibility there. That was in the law that authorized the 308 reports.

Q: 1927 Rivers and Harbors Act.

A: Yes.

Q: Ted, I want to go back and pick up some areas that we haven't really covered. As you know, beginning in the late 1940s in particular, there was growing criticism really of both the Corps of Engineers and the Bureau of Reclamation about the size of water projects, expense and so forth, so there was an increasing concern about both expense and environmental devastation.

Do you-looking back, as I'm sure you have over time-do you see any particular seminal causes for this growing concern, or do you think it's a

general kind of evolution as a result of the massive constructions going on since the '36 Flood Control Act, or whatever?

A: Well, one thing happened that really affected the reputations of both the Bureau and the Corps adversely. All during World War II some of the staff of both agencies was still working on civil functions. The Bureau had its Food for Victory program and the Corps had its 308 reviews going along, to the extent that they could get funding. I don't know how the Corps did it, but-when money was appropriated for the Bureau, it was "no-year money"-available until expended. At times, the Bureau would have $100 million or so, more or less in the bank, of funds that were appropriated and not spent, so they could keep that work going regardless of what Congress did.

That's all been changed now. Construction appropriations still are available until expended, but the committees keep a much closer track of them. But decisions were made all during World War II and for a year or so afterwards to make estimates of costs of projects at 1940 price levels, the feeling being that we were bound to have another horrendous depression after the war, just as we had after the Civil War, just as we had after World War I, and probably after the Spanish War, and so eventually price levels will simmer down to prewar prices.

So, on all the projects in the 1944 Flood Control Act and the '45 Rivers and Harbors Act, the authorizations were on a basis of costs contained in reports made at 1940 price levels. The Bureau of Reclamation also had a lot of projects under way on the same basis. For example, the Colorado-Big Thompson project had been started and the tunnel was holed through before World War II, or during it. The project was supposed to cost about $50 million and the local interests signed a repayment to pay half, but not more than $25 million, which was half of the estimate. Before the project was completed, the Bureau had spent $175 million. The Corps got all those projects authorized in 1944 and 1945 and when they went to build them they cost sometimes two and three times or more than their estimates. People who were concerned with government expenditures had the feeling that these agencies were just making low estimates to get their nose under the tent and their primary motive was to spend more money.

It was just a lack of understanding on the part of the agencies of what was going to happen. The pent-up demand that caused the economy to boom when

the war was over was not foreseen. It's not so much that there wasn't so much demand after the Civil War, it's just that marketing techniques are so much more sophisticated, radio, television, advertising-you've got a much better market, and that's why we didn't have a big depression after World War II-at least that is my theory about why we didn't have a depression. Now, an economist would have something else to say about it, I'm sure.

I don't remember when the Corps stopped making cost estimates based on 1940 price levels, but until it did it looked as if here was this agency trying to get its nose under the tent and then, once it got the project authorized-say an $8 million project authorized-they'd spend $40 million on it. Some of that is still going on. For example, on the Tennessee-Tombigbee Waterway, which was one of the projects authorized about that time.

Q: 1946. Right.

A: And so there was a feeling that these agencies were only interested in aggrandizing. Then there were the people who were being hurt, the people whose lands were being flooded. For example, projects like at Tuttle Creek where the Corps incurred the animosity of people whose families had lived on those homesteads for a hundred years.

There's always been that kind of a backlash against the Bureau and the Corps built up, but I don't think-maybe I've been too close to it to see it-1 don't think there has really been any feeling, ideologically, that these agencies were getting too big. Now, there's another view expressed by a gentleman up in Minnesota named [Adolph] Ackerman who's written books citing a book called *Oriental Despotism*. I can't remember who wrote it.

Q: Wittvogel.

A: He wrote that book, alleging that governments control their people by controlling their water supply. Adolf Ackerman has gotten a few of the engineers, for example, who are, by nature, conservative, to cite Wittvogel against the Corps and the Bureau. But when you really look at it, they are attributing motives to government engineers that I don't think are there. Admittedly, there have been some ideological issues like the public power and other issues like that, that have-that might, in some people, might have been termed as ideological, and this has led some people into fear of government

domination. This came up in the Hells Canyon fight but largely as a public relations campaign funded by the Idaho Power Company and probably by the whole private power industry which, I think, united on that. They got the EBASCO services to come down and testify against that project.

And so all of that is underlying the surface here, and that is probably one of the reasons that the magnitude of the Corps' and Bureau's programs has declined as a percentage of the federal budget. I think most people in the West have looked on the Bureau as helping them and people in the East who have benefitted from Corps' projects look on it as helping them, rather than being government run amuck.

What people are complaining about are expenditures on government programs that don't help them. This is why people think the government is too big. They don't object to Social Security or Medicare or any of the programs that help them. They're always objecting to what somebody else gets.

But there are some great abuses of the programs, for example, when the Corps of Engineers and the Bureau of Reclamation tangled in the Pine Flat case. The Bureau thinks it got authorization through its finding of feasibility on Pine Flat as a reclamation project, under which local people would have to pay their share of the costs. Some of it would be paid by power revenues, of course.

And then the Corps took the position that Pine Flat is a flood control project and got authorization from the Congress to build it as a flood control project. This kind of a struggle tended to repel a lot of people and make them feel that this is just two bureaucracies fighting and that all of these projects are just pork barrel stuff.

Arthur Maass *(Muddy Waters)*

Q: Well, Arthur Maass in his book, *Muddy Waters*, makes a great deal of the Pine Flat case, showing not only a certain arrogance on the part of the Corps of Engineers, but also, of course, the clout that the Corps has within Congress, suggesting that Congress, through the Corps, can more or less have its own way when it comes to water projects. If people don't like what the Bureau of Reclamation is doing, they can go to the Corps-and I suppose vice versa. But in this particular case, it would be cheaper for local interests if the Corps were

to build the project, so therefore it would be something that Congress would favor doing that way.

Let me ask you about-about Maass' argument, and then you can elaborate a bit about it. You know or are familiar with *Muddy Waters?*

A: Of course, Arthur Maass and I were at Johns Hopkins together. We were both in the class of 1939. He was taking a liberal arts course, and I was taking engineering. We were not great buddies at the time, but we were both involved in the student council and various campus activities. Arthur was on the social committee to arrange the dances and so forth, and I was on the student council trying to regulate the way that group operated.

Arthur was, in my view, quite liberal. And I was more or less a conservative engineer. Some of the engineers looked on Arthur as being a kind of a flaming liberal on campus, not quite as liberal as Murray Kempton, who was in the same class, or Walter Schlesinger, who was actually, admittedly, a member of the Young Communist League, right on campus. This was in the mid-'30s.

Arthur came down from Harvard one summer to work in the Department of the Interior for the Hoover Commission. I gave him a lot of information about the Pine Flat flap, because I was deeply involved in it through my role as coordinator with the Corps of Engineers. And you remember, Section 8 of the '44 Flood Control Act required the Bureau to get some reimbursement for the irrigation. I think they finally settled on a $14 million reimbursement, which the Bureau didn't think was enough and the Corps thought was too much.

So I had a lot of information on the controversy, which, as I recall, went into the Pine Flat chapter of *Muddy Waters*. Arthur, of course, is much more scholarly than I am. Of course, he was involved much earlier when he was working for the National Resource Planning Board. My recollection is that Maass covered the fact that Roosevelt decided in favor of the Bureau of Reclamation but that the Corps, with the assistance of the Congress, overrode him. And Roosevelt was probably one of our strongest Presidents.

I don't have any problem at all with what Maass has said about that. I would certainly agree, although I haven't reread it recently.

Q: Well, during this time, at least at the political level, the criticism of both the Bureau of Reclamation, but more particularly the Corps of Engineers, was centered within the so-called first Hoover Commission, which was organized in 1947 basically in response, as I understand it, to an expansion of federal agencies during World War II. It was not organized specifically, of course, to pick on any particular agency and certainly not to pick necessarily on water resources, but Hoover spent a fair amount of time looking at the water agencies. And, as you know, one of the recommendations of the commission was to consolidate the water resources agencies.

Can you tell me something about that and something about the Bureau of Reclamation's response to that particular proposal?

A: Well, I was right in the middle of it as a representative of the Bureau on various work groups. Of course, the Bureau generally favored that recommendation because it was felt that for sure it would be the surviving agency and because there was always the argument that water resources is not a military function. So I was one of the people in the Interior Department that was providing information for the staff of the Hoover Commission.

Now, that may have been how I got involved with Arthur Maass on the Pine Flat project when he was in Washington working with the Hoover Commission. But I do remember doing quite a bit of work for them on the Pine Flat controversy. I was primarily involved in getting the agreement on how much the local people would pay. I think it came out to $14 million. That's why I had the background in it. But I worked on background for both of the Hoover Commissions, as well as for President Truman's Water Resources Policy Commission, so unless I go back and really look into my files, I can't remember exactly what I did for which one. But the Bureau was always in favor of the consolidation, if the Bureau was going to be the surviving agency, and the Bureau felt that it should be. The Bureau's position was that if you have a Department of Natural Resources, which it favored, you certainly would have water as a part of it, and the Bureau of Reclamation was there to take over.

The Bureau, of course, always felt that its programs were more sound economically than the Corps' because each project had to come up and be authorized separately and was subject to the reimbursement provisions of the reclamation law. They overlooked such items as interest on money, and even

the fact that at one time they used some pretty fancy accounting on the basis of a solicitor's opinion that, even though they had to collect interest on the power allocation, that didn't mean they couldn't apply the interest also to subsidize irrigation. And this infamous piece of legalese was called the "Solicitor's Opinion" for years and years and years. And it just didn't make much sense, but that was how the solicitor of the Department of the Interior interpreted the law.

And this kind of thing generally turned some of the professional groups, such as the American Society of Civil Engineers that I belonged to, and various other groups of basically conservative people against the federal agencies. I'm sure the argument was made by lots of people at the time that surely the federal agencies are just trying to increase their clout and their size just for the purpose of bureaucratic aggrandizement.

And nobody can argue against the fact that both the Bureau and the Corps had strong congressional supporters. The Corps always had had an advantage over the Bureau in this area because its program covers all 50 states and the Bureau has been limited to-well, I guess counting Alaska and Hawaii, 19 states; but for a long time, it was just the 17 contiguous Western states. And the Bureau's projects came along with some strings. When they built a project, they expected to get something back.

Q: Not too much.

A: Not enough, except the local people always seemed to agree with the Bureau when the Bureau said, "The law requires us to demand full repayment on this project, " ignoring the fact there was no charge for interest. There may have been some justification for using interest-free money out of the reclamation fund in 1902 with a lo-year reimbursement period. Ten-year reimbursement without interest is one thing; 40 years is another thing. And then there was another lo-year repayment free development period.

Anyway, the Bureau did get some reimbursement, usually about 12 to 15 percent of the actual total costs which is more than the Corps got on most of its projects.

River Basin Commissions

Q: Well, there are a couple of things happening here. I suppose they complement one another, but on one level, they seem to be a little bit contradictory, too, and that is this: you have the Hoover Commission, the first Hoover Commission, and also President Truman's Water Policy Commission coming out in favor of a consolidated Water Resources Department within the federal structure.

On the other hand, those same commissions are arguing for the establishment of river basin commissions around the country. Of course, this goes back to some of President Roosevelt's ideas for a Missouri Valley Authority which never did get off the ground as Roosevelt conceived it.

That seems to be a step towards obtaining, or giving to the states, perhaps, a bit more say so in what's happening to regional water development-nonfederal interests, in any case. How do you interpret this interest in river basin commissions at this particular time, which, of course, leads finally into something else.

A: Where this got started, I think, was either the National Conservation Commission in 1908 or the National Waterways Commission about that same time in the Teddy Roosevelt era. He supported the idea that we should develop every river and use every drop of water profitably, all the way from the headwaters to the sea. There was almost a kind of a cult for river basin development-it wasn't a cult, really, in that sense, but a lot of people felt that that was the ultimate objective, and then they immediately started running into state lines and agency jurisdictions that made it impossible to do this, and that started people thinking in terms of organizations based on river basins.

The real problem, as I see it, was the need to coordinate the agencies working in the river basin. We've tried to coordinate the federal agencies as far back as 1910. I think the Inland Waterways Commission was set up really in the hopes that it would coordinate the agencies. They reported about 1912, or whenever it was. But instead of doing the job, they made another report which called for coordination. Then the Newlands Commission was authorized in the 1917 act but was never established. I think one of the reasons it was never set up was that the Corps saw a potential threat in it. Maybe the Corps and the Bureau both saw a threat in it. Instead, we got the Federal Power Commission

authorization for comprehensive basin studies in 1920. I'm sure there were an awful lot of behind-the-scenes operations that I've never seen documented.

I'm sure one of the antecedents for the House Document 308 report was when the Federal Power Commission staff decided to do these comprehensive studies and asked for funds. They put it in the budget, instead, the Congress authorized the Corps to make the list of river basins which eventually was published as House Document 308. When the studies were authorized, there was a requirement for some coordination with the Bureau of Reclamation and the FPC, and they were participants in parts of the studies but it was a far cry from the coordination contemplated when the Newlands Commission was authorized.

The 308 report on the Tennessee River basin provided the basis for the Tennessee Valley Authority, which solved the coordination problem by keeping the old-line agencies out of the basin, so they didn't like it. But the need for coordination of the agencies' activities within river basins was still evident. So when the issue came up in the water policy commissions, there were a lot of conflicting opinions. When President Truman's Water Resources Policy Commission took up the subject, one of the ways that they got agreement was what we used to call the "Quaker" method-when there's something that you can't get agreement on, you drop it out. And so when you look at the commission's recommendation for river basin commissions, it kind of got down to the fact that since you can't really resolve this Corps of Engineers/Bureau of Reclamation/SCS problem, and you have a real problem with state lines that you can't resolve, you should set up an organization to handle the problems. It was a kind of a mild recommendation and I think a good recommendation. Of course, it formed the basis for a lot of planning that we've done since then.

Certainly the Senate Select Committee was definitely working on the basis of the river basin as the organizational unit for planning and wanted river basin plans drawn for all river basins. But Senator Bob Kerr didn't have independent river basin commissions in mind. He had in mind another Arkansas-White-Red basin type of report and he wanted an authorization in each basin like the Pick-Sloan Plan-an authorization that approved a plan and authorized the initial stages, and when you find a project you want, you just bring it to the Congress and get it authorized easily because it's already in the overall plan.

So the idea of river basin commissions was never really resolved by the Senate Select Committee, and I doubt if it ever will be, now that the Reagan administration terminated them. I can argue either way, that we ought to stick with the political jurisdictions we have, the states, with interstate compacts where needed, or I can argue that from a hydrologic standpoint, it really doesn't make much sense to split some of these river basins right down the middle the way we do where the river is the boundary, as, for example, between Washington and Oregon. It would make much more sense to make one state out of the western slope of the Cascades and another one out of the eastern slope, because you've got a natural geographic division. Of course, that still would break the Columbia River basin in half but it wouldn't split it down the middle.

But to have the whole Columbia basin or the whole Colorado basin as one state would give you a rather unwieldy political organization, too big to govern.

So it's just inevitable, with the kind of government we have that there will be a lot of hydrologic inefficiencies, but so far our government has been adaptable enough to cope with them. If you go over to the Soviet Union, you get a lot of the same conflicts around Lake Baikal, for example, the environment versus development. I don't know how they're organized with respect to the rivers there, but I think our system is still the best, and I certainly wouldn't try to go back and redivide the country into river basins because then you start having clashes over other functions.

The Green Book

Q: Well, let me turn our attention to something else that's developing about the same time. You had mentioned earlier the FIREBRICK and, as you know, one of the subcommittees under FIREBRICK did develop something which—let me consult my notes here to get the exact title—"The Proposed Practices for Economic Analysis of River Basin Projects," which was published in 1950 and commonly called the "Green Book."

Can you tell me something about the background to the development of this report which has a fair amount of influence in the subsequent 10 years or so?

A: Well, it did, and I mentioned that earlier when I was talking about George Beard. George Beard was the Corps of Engineers representative, and I think Jack Dixon was the Interior representative for a while, and then later Reginald Price was the Interior representative. Reginald Price was in the department after Bill Warne became the Assistant Secretary for Water and Power.

The Green Book was developed with a great deal of discussion; another Corps person that was involved was Gene Weber. He was the staff person who took over when George Beard left to go out to the Pacific Northwest. I was only peripherally involved in that because of my staff role with the chairman and later the departmental member of the FIREBRICK, but I sat in on a lot of the meetings. There were many arguments. The big argument first was the Bureau of Reclamation wanted to use gross crop income as the measure of the benefits from irrigation, and the Corps of Engineers argued that you should take account of the on-farm costs so you should use the net benefits. Of course, when you go to the net benefits for agriculture, there's not very much and very few projects could be authorized.

But then the Corps of Engineers had its policy of using primary and secondary benefits, and also direct and indirect benefits. By the way that they were defined, you could do almost anything you want to prevent flood damages, and the gross value of the crops destroyed by floods was considered a direct benefit. That was the first battleground over the first draft of the Green Book. The Green Book in 1950 was the second draft. The first draft was put out, I think, in 1948, and there were not too many changes in the 1950 draft, but I think it got more involved with the recreational benefits.

The Corps wanted to use the cost of indulging in recreation, in water-based recreation, as a direct benefit, in other words, figuring that the people who are going to go boating or fishing or anything at a reservoir will spend a lot of money for equipment and transportation to get where they're going. The Corps was using that argument and somehow in the debates, which were dominated by George Beard, the Corps always seemed to win. I really attribute that to George Beard, but it seemed to me there were a lot of fallacious ideas on both sides. And, not having been directly involved, I'm hesitant to step into areas that Henry Caulfield and possibly Arthur Maass and some others were more closely involved with than I was.

Of course, I've used the Green Book and referred to it many times, and it became the basis for Senate Document 97 much later.

Bureau of the Budget Circular on Water Resources Projects

Q: I don't know, of course, how much light you can shed on some of these issues, but I'll ask you the questions, and if there's not too much to be said, we can just move along.

I'm interested in the relationship between, say, that publication and something that comes out in December 1952 from the Bureau of the Budget: Circular A-47, which is called "Bureau of the Budget Circular on Water Resources Projects." It comes out at a fairly interesting time because it's after Eisenhower was elected, but before he takes office.

A: Well, I can shed a little bit of light on that. It really stemmed from President Truman's Water Resources Policy Commission. When that commission was created, and, of course, the Bureau of the Budget had an awful lot to do with getting the commission created, it was hoped that it would develop criteria and standards for evaluating the feasibility of federal water resources projects. A gentleman named Ed Ackerman—that's Ed Ackerman; not Bill Ackermann—was on the staff and he was probably the executive director, or something, of the commission. Gilbert White was the resident commissioner and Morris Cook, I think, was the chairman. Isn't that the one that—

Q: Cook was the chairman. Ackerman was—I'm not sure what Ackerman's position was. In 1949, he's a professor of geography at the University of Chicago and he submits some material to the government, to the—probably to Morris Cook.

A: That's right, and he came back, and he worked on the Bureau of the Budget's response to the commission's report. Anyway, the Truman Water Policy Commission didn't come out foursquare, in unequivocal terms, for sound economics. In other words, the Quaker method resulted in some kind of equivocation in the judgment of some people, and I know I'm probably stepping on Gilbert White's toes when I say that, but it just somehow didn't do what the Bureau of the Budget wanted to do.

So the Bureau of the Budget hired Ed Ackerman. He was a full-time staff man for the Bureau of the Budget, and a number of panels were set up to critique and develop the action-you remember, the commission didn't make any legislative recommendations. In fact, it was not within their charter to make legislative recommendations. There was a draft of a bill prepared by someone which I don't think was ever introduced. I remember seeing a copy of it printed up as a congressional bill. It may have been printed at the Government Printing Office as a service for one of the members of one of the congressional committees who was interested in implementing the Cook Commission recommendations.

But none of it really satisfied the Bureau of the Budget by giving them the peg that they wanted to hang their hat on to stop all this nonsense of building projects where the economic justification was somewhat specious. And so Ed Ackerman set up all these panels at the Bureau of the Budget following the submission of the report to the President, which I guess was either early in 1951, or late 1950. The President's commission could only operate for one year.

Q: I think it was actually 1950. They operated during the year of 1950.

A: So it came out in '50, and it was probably in 1951 that Ed Ackerman worked with all of these panels. I was on a couple of them representing Interior, trying to develop ways to implement the Cook Commission report. I cannot say how they got from that to Budget Circular A-47, except that a lot of attempts were made by the panels to reach a consensus. I was on the panel dealing with navigation, for example, and I'm sure they had people from the Corps of Engineers on the one dealing with irrigation. They were trying to get down to some agreement but we were all defending the interests of our own agencies.

The Corps representative on this navigation panel was Haywood Faison, a very distinguished looking gentleman. I think he was from the Board of Engineers for Rivers and Harbors. We were working with Ed Ackerman, trying to get some kind of agreement on some principles which would satisfy the Bureau of the Budget and which would give a rational basis for making water project decisions on the basis of sound policies.

Out of all those working groups or panels came report after report after report, and then the whole project seemed to die on the vine and then disappeared until

suddenly Budget Circular A-47 appeared, as you pointed out, in the interregnum between Truman and Eisenhower. I think they got frustrated with all these panels not being able to really agree on anything. For example, on the water transportation panel, Haywood Faison, representing the Corps of Engineers, was not about to agree on a policy that would base navigation project justification on costs of alternatives rather than on rail freight rates. A Corps person just couldn't agree to knock out the economic justification for the Arkansas River Navigation project. Well, maybe he could, but they would have gotten somebody else to represent the Corps the next week.

Well, anyway, the panels didn't get anywhere, and so I think that some staff people, probably people like Floyd Peterson who was the assistant chief of what was called Resources and Civil Works produced the draft of A-47. Maybe it was even before him, possibly Charlie Curran was still there at that time, and he was a staunch critic of agency economic policies.

Whoever was responsible saw that this was their chance to put some rigorous policies in effect, with a new tough Republican administration coming in to enforce them; but with the responsibility placed on the outgoing administration. There wasn't as much emphasis on transition teams as we have now. I don't know whether the name had been invented. We had people doing it, but it wasn't as organized.

Q: And there weren't as many political appointees in the Bureau of the Budget.

A: There were only two or three of them.

Q: Yeah.

A: That's right. Anyway, so I can see the handwork of Floyd Peterson in this, and maybe Charlie Curran, because they were the ones who were the most critical of the Corps of Engineers and the Bureau of Reclamation policies. A-47 establishes very rigorous economic policies for all projects to meet. I don't remember all the details, but there were increases in local cost sharing on recreation and on fish and wildlife conservation and preservation, that would make it very difficult to get projects authorized.

But that's the way things get done. And if it had been Reagan coming in, probably, with the support of the Heritage Foundation, A-47 might well have

been implemented. But instead, the Congress had hearings which I attended, much later, with Bob Merriam who was the political assistant director of the Bureau of the Budget [BOB). The hearing was chaired by Senator Kerr and when the discussion of A-47 came up the Eisenhower administration withdrew from it. Bob Merriam said we didn't issue this; it was done before we came into office. Then they heard from some of the old-timers, staff people from the Truman administration, who said, "We didn't see it before it came out. We don't know where it came from." And this led Senator Allen Ellender to launch into a discussion of Louisiana law which defines eight different kinds of bastards, and he said this seems to be a ninth kind.

Q: Amazing. But would you say the general thrust of BOB Circular A-47 would be to exclude some projects from consideration for federal construction that otherwise would have been considered beforehand? Is that stated too strongly?

I'm talking particularly about something like the 50-year standard project amortization period versus the 100-year standard project amortization period as a justification for construction, and so forth and so on.

A: Yes, the economic standards in A-47 are much more rigorous and would exclude some projects, but the big issue in this one was reimbursement-local cost sharing-and if I remember right, A-47 recognizes land enhancement value as a major local benefit which should be reimbursed by local, nonfederal interests.

At that time the Corps was building all those projects down along the bayous in Louisiana and Arkansas, adding them on to MR&T—the Mississippi River and Tributaries project-on which the federal government, in consideration of the fact that the locals had put in so much money before the project was authorized, is paying all the costs, including operation and maintenance, and purchase of lands, easements, and rights-of-way. So, when the Boeuf and Tensas bayous projects were added on to MR&T, with the federal government picking up the tab on all of the costs, even though these were primarily land reclamation projects-clearing swamps and making agricultural crop land-there were tremendous benefits to the local landowners. Requiring local contributions for land enhancement benefits was one of the main thrusts here which would have had a major impact on the Corps. It was not to stop them from doing it, but it was just to get the local contribution for land enhancement, as well as local contribution for recreation and fish and wildlife

enhancement. You know, it's been so long since I've looked at this that I can't remember all of the details.

I don't think there were so many differences between the definition of benefits in A-47, for example, primary and secondary benefits, and but it pretty well ruled out the use of secondary benefits on the grounds that they would come from any federal expenditure, and so forth.

The big change that I see in A-47 from the Green Book and it's not so much a change from the Green Book but it's a change in policy-is increasing the reimbursement-the local cost sharing. The standards proposed were more rigorous but I'd have to go through in detail to remember them-the standards for recreation benefits, for example, and the repayment of irrigation costs. A-47 made them more rigorous, whereas the Bureau of Reclamation tended to adapt the policies to the project.

For example, when they reviewed a project that was already built and the irrigation district people wouldn't sign a repayment contract because they didn't have repayment ability, the Bureau would reevaluate the project and would renegotiate the contract under the Reclamation Act of '39. If it took the local people several hundred years to pay the project off without interest, the Bureau would renegotiate on that basis. There was one project in Oregon, just west of Pendleton, which was renegotiated on the basis that they'd pay back at 326 years. I think it was a little project that had been built years earlier, and they couldn't get a repayment contract.

So A-47 attempted to eliminate any new projects like that by requiring a more rigorous economic analysis.

Q: Well, the circular, in a sense, does seem to anticipate some of the general philosophical predilections of the Eisenhower administration. I'm talking generally about the idea of what we'd call the cost sharing, the sharing of financial burden, or more of an emphasis on smaller projects than larger ones. So, you know, were they anticipating, do you think, what Republicans might be bringing into town?

A: Yes, there's no doubt that Floyd Peterson and Charlie Curran anticipated that the Republicans would move toward what I would call sound economic policies and you might call them conservative policies. I don't really feel that

Eisenhower himself was any more, or even as conservative as Truman, for example. But a lot of this is in perception. If Taft had been elected, it would have been more conservative. Taft was an old-line Republican, but Eisenhower was not. In fact, I'm not sure that Eisenhower knew whether he was a Democrat or a Republican until they asked him to run for the presidency.

And there were a lot of liberalization in policy made in the Eisenhower administration. One that I was directly concerned in, for example, was the Corps' single user policy for navigation projects.

Resources and Civil Works Division, Bureau of the Budget

Q: Was that after you went over to work at the Bureau of the Budget?

A: Yes. I went over to work on the staff of the Resources and Civil Works Division of the Bureau of the Budget in 1954. The division director was Carl Schwartz, and Floyd Peterson was the assistant director for the water and power side. There was another assistant director for the agriculture side, and there was a special projects branch also. My immediate superior was Charlie Warner, and Charlie Warner always called himself an "old mud digger" from the Corps of Engineers Philadelphia District. He grew up in Delaware and worked in the Philadelphia District in the dredging unit. He eventually ended up in the New York Division office and was involved very much in dredging. He knew every inch of the Delaware River and all the other rivers up and down the Delaware and New Jersey coasts. He was brought into the Bureau of the Budget to work on the Corps' budget and he knew where a lot of bodies were buried,

Floyd Peterson was another old Corps hand out of Minneapolis, or somewhere in the Midwest, possibly up where Gene Weber came from. And Pete had come into the Bureau to replace Charlie Curran after he had gone up to the Library of Congress as their first senior specialist in engineering and public works, a job that I had later. Charlie Curran was a very rigorous thinker, a conservative on economic principles, and the A-47 Circular would have probably been a little bit too liberal for him, but he was gone by the time I got there. Ed Ackerman may have had some involvement in the preparation of Circular A-47, but he had left the Bureau of the Budget before I got there. Ed Ackerman was really a brilliant man. I have great respect for him-a real

facilitator to get things done within the bureaucratic system. I think one reason was that he was willing to use Gilbert White's Quaker method, whereas Floyd Peterson or Charlie Curran wouldn't. No, sir. They would stick to their guns, no matter what. Anyway, I'm just telling you the set up I went into in 1954.

Charlie Warner and Floyd Peterson, between them, had taken on the project of getting rid of a lot of the district engineers' survey boats. The government would confiscate these boats from people running drugs or some other illegal activity. Many of them were fancy 40- and 50-foot cabin cruisers which the Corps claimed as survey boats and which turned out to be used as a kind of a district engineer's yacht when he needed it. A lot of that type of thing was corrected during the Eisenhower administration.

Another thing that happened in the Eisenhower administration was in connection with use of airplanes. The Bureau of Reclamation was one of the first agencies to have its own airplane. It had a Lockheed Lodestar, which was a very nice airplane that Mike Strauss used for travel. I flew out to Phoenix in it to help write the Central Arizona project report in 1947, so it must have been acquired shortly after the end of the war.

And the Eisenhower administration decided to get rid of all that kind of folderol. A government agency having its own airplane! That was unheard of. So they made the Bureau of Reclamation declare it surplus, to reduce government expenditures. But that didn't happen. The chief of the Forest Service decided that he needed a plane, so it was picked up for the Forest Service, which hired the Bureau of Reclamation's pilot.

Q: The Corps had about three planes, I think, at one time.

A: Yes. The Corps, had a DC-3, which was called the chief's plane. I remember flying in it on an inspection trip over the lower Mississippi valley when I was working for the Bureau of the Budget.

Getting back to the way the Bureau of the Budget dealt with the Corps of Engineers' budget. We had people there who knew a lot about the Corps from first-hand experience. I had worked for the Corps in the Baltimore District and the Seattle District and had been the liaison between the Corps and the Bureau of the Budget. I had been eight years with the Bureau of Reclamation here in Washington and had had a lot of familiarity with the Corps' programs. So the

Bureau of the Budget hired me not to work on the Bureau of Reclamation budget, but to work as an examiner on the Corps' program. And we had Charlie Warner and Floyd Peterson, both of whom had had that experience in Corps offices.

But we didn't leave it at that. Every year, every member of the staff went out to the field for three or four weeks to look at the projects and become familiar with the program. That was the plan, so that we had staff that really knew those programs. I went up and down the Missouri River one year and even crawled up into the scroll cases of the turbines that were under construction at the Garrison Dam. I don't know why, but that was my nature, to see what it was like in there before the water came in.

And I went up and down the Mississippi. I remember seeing some places along the Mississippi levees that seemed just like the old plantation days-Moon Bend on the Mississippi River within a few miles of Memphis, for example. We drove the levees maybe for 50 miles or so south of Memphis.

So the budget examiners really knew the programs very well. At that time, Joe Tofani was the budget officer for the Corps, and we had a very good arms-length relationship. Incidentally, Joe had come to the Corps from the Bureau of Reclamation and so we had a lot in common. I had known Joe off and on since the middle Rio Grande fight when we first met, which would have been 1946 or '47, before the '48 act, anyway.

So we had a lot of respect for each other and we worked well together and the Corps was very responsive because they knew that they couldn't put anything over on us. At that time, I wasn't working on the Bureau of Reclamation program at all, but the Bureau was always fighting us. The Bureau had been fighting all the time because the Bureau of the Budget wanted to eliminate the use of secondary benefits for project justification. They would write really nasty letters back to the Department of the Interior, trying to stop projects like Central Arizona and the Santa Barbara project in California. The Bureau of the Budget, as I recall, rarely ever approved Bureau of Reclamation projects.

Q: You're talking about the Santa Barbara dredging project.

A: No, the Santa Barbara County project. There were two or three aspects of the Santa Barbara County project-the Cachuma Dam and a tunnel through the

mountains to bring water into Santa Barbara. And they eventually called it the Cachuma project. The Bureau of Reclamation fought that project through in spite of the Bureau of the Budget's objections and made a finding of feasibility on it, because it was one of the really good Bureau projects. It was fully reimbursable, except for the interest, because they were growing avocados and nuts on the agricultural lands. Most of the water was going to be municipal water.

Q: Right.

A: Anyway, what happened most of the time was that the Bureau of Reclamation fought, and if they lost, would take their arguments to the White House and lots of times win over there, even in the Eisenhower administration. The Corps never did that. They never went to the White House to get something reconciled. They always said, "Yes, sir." "Yes, sir." And they agreed to put it in the budget, or the letter or whatever we were arguing about. Of course, then on the Hill, the Corps always got what it-mostly always got what it wanted-through the committees.

Executive Order 9384

Q: Let me ask you a question about that. I have to go back and although I don't like to intrude myself in an interview, but I need to repeat some information. As I understand it, beginning in 1940, actually, President Roosevelt directed all federal agencies to send their reports and studies through what was then the Bureau of the Budget—

A: That was under Executive Order 9384.

Q: Right. And the Bureau of the Budget was to submit the comment on that report. What I'm trying to get to is this: throughout this period, beginning with 1940, the federal agencies would submit reports to the Bureau of the Budget, and the Bureau of the Budget would-could do one of three things: have no comment on the report, say that the report was not in accordance with the policy of the administration or words to that effect—

A: They could say it was not in accord with the program of the President.

Q: -not in accord with the program, or is in accord with the program of the President. But, regardless of what was said, the report went forward to Congress, so far as I know. Now, that's different than it is today. I don't know when it changed.

A: I don't know what's going on today, but I think Executive Order 9384 came out of the work of the NRPB before it was abolished. I'm not sure when it came out, but I don't think it spelled out in detail what the Bureau of the Budget could say. I think what it said was that the Bureau of the Budget's comments had to accompany the report to the Congress. They made simply devastating comments on the Santa Barbara County project of the Bureau of Reclamation. I remember arguing with Charlie Curran about it when I was still with Reclamation. I don't think we won the argument, but it didn't stop the department from sending it up to the Congress and getting the project authorized.

Q: That's right.

A: If they said it was not in accord with the program of the President, it had to go up saying that. Writing those letters was my job in the Bureau of Reclamation; writing the commissioner's report to the secretary, the secretary's report to the President, which got to the Bureau of the Budget and then when the Bureau of the Budget comments came back, sending it up to the House and the Senate with the comments.

Milliken-O'Mahoney Amendment to the 1944 Flood Control Act

Now, the other thing that we haven't discussed yet is that the Milliken-O'Mahoney amendment to the 1944 Flood Control Act-I guess I did mention it-required the Corps to comment on the Bureau's reports, and vice versa. The states also had to be given an opportunity to comment on any project, and all of the comments had to go up to the Congress when a recommendation went up. But you could send them up, no matter what the Bureau of the Budget said, although an agency would probably try to modify a project to get into accord with the President's program, if it could. And that's why we had all this haggling over the Santa Barbara County project, which became the Cachuma project eventually.

We haggled over some other projects, too, and would override the Bureau of the Budget once in a while, by somebody going to the White House. By going over their heads, sometimes you'd get the Bureau of the Budget to change their comments or tone them down or something like that. And this, of course, was a political matter where the secretary would be the only one that could go to the White House, or maybe an assistant secretary, not a staff person like me.

That went on once in a while, but I don't know that there was ever any prevention of a secretary of a department sending a report to Congress as long as he would send the comments.

By the time I got to the Bureau of the Budget in 1954, they had prohibited the Bureau of the Budget from saying something was or was not in accordance with the program of the President, unless it had been taken to the President himself. Now, of course, with Eisenhower, that meant to Sherman Adams, but still, that was pretty close, and Sherman Adams would probably mention it to the President .

The reason that happened was that during the Truman administration, Truman went out somewhere with Senator Clint Anderson and said, We've got to build this dam and we're going to put it in next year's budget. " And then the Bureau of the Budget wrote that the project wasn't in accord with the program of the President. Clint Anderson just went to Truman and raised hell. This was when Clint was a senator not when he was Secretary of Agriculture. And that's when, I think, the Bureau of the Budget got its instructions. I never saw it in writing, but it was understood we could not say something was or was not in accordance with the program of the President unless he had definitely approved it.

Let me mention one time when the Eisenhower administration liberalized the Corps' policy. The Corps, as far back as the beginning of the century, had what they called a "single user" policy for navigation projects. If you were going to build a project which was going to be used by just one user-for example, dredging a 50-foot channel, up to Baltimore-and if the only shipping that needed a 50-foot channel, deeper than a 40-foot channel, was the Bethlehem Steel Company, the Bethlehem Steel Company should be taxed by a local port agency to pay half of the cost of deepening the channel from 40 to 50 feet.

That was a long-standing Corps' policy. Another Corps' policy was that if you were dredging a new channel into a new area such as Portland Harbor in Oregon where they had to dredge the Willamette River to allow ships to get up to Portland, or the Houston ship channel, which was built to bring shipping up into Houston where there was no existing channel, the policy was that local districts or authorities, "local interests" is what the Corps calls them, had to pay half of the costs. The Corps couldn't take money directly from an industry. It would always have to be through some kind of a political body which was authorized to do it. The local interests paid half of the costs for the initial deepening of the Portland Harbor and also for the Houston ship channel when they first started. I'm sure they did it on a lot of others.

So when General Lewis Pick sent up the report recommending deepening of the Delaware River up to the Fairless Works of U.S. Steel near Trenton, but on the Pennsylvania side, he recommended that local interests pay half of the added costs of dredging a 45-foot channel above Philadelphia because the ore carriers were the only ships that needed more than 40-foot depth. I don't remember whether it was 50 feet or 45 feet that was recommended.

But anyway, because you needed that extra 5 feet of draft, the single user, in this case the U.S. Steel Company, under the long-standing Corps' policy would have to pay half. This, of course, would have to be done through the Delaware River Port Authority, which would somehow arrange a way to tax U.S. Steel. And that was the policy when the report came up in the Truman administration.

The report may have been cleared by the Bureau of the Budget during the Truman administration, or it may have still been in the Bureau of the Budget. All of these reports, would pile up while we were working on the budget in the fall and didn't have time to review reports. I usually had a stack of reports on the table in my office, because I was responsible for reviewing them for the Bureau and writing comments back to the Corps. And the stack built up right before the omnibus bill.

When the Eisenhower administration came into office in 1953 all of the project reports, including the upper Delaware, were sent back for review, and my recollection is that the Corps reiterated the recommendation for local cost sharing under the single user policy. I don't remember exactly the timing of this but it must have been in 1954.

Ben Fair-less was the chairman or maybe by that time the ex-chairman of U.S. Steel and was a member of the Hoover Commission and I'm sure he was a staunch Republican. One day we got word from the White House, down through the staff, that we should relax the single user policy for the Upper Delaware project. One of my very astute staff members brought me a newspaper clipping the next day showing that Ben Fairless had been a dinner guest at the White House the night before we got that directive.

So, the feeling was that he was the one that had influenced the President. We took this as a definite order from the President to the Bureau of the Budget to the Corps of Engineers. So when the Upper Delaware project was cleared by the Eisenhower administration, they put some language in the Chief of Engineers' report to the effect that, even though the only use of the project at the present time is for the steel works, eventually it will attract other traffic and will be used by other shipping, and therefore it should be carried out fully at government expense.

The staff argued against it on the grounds that it didn't make sense, because U.S. Steel was paying for dredging the Orinoco River for bringing the ore out of Venezuela. They were actually going down there and dredging the Orinoco River, but they wouldn't dredge their own.

Dredging the upper Delaware River was expensive, because it was digging into rock to get that extra 5 feet, so it was a very substantial amount. I don't remember how much, but it was tens of millions of dollars that local people would have had to put up.

This is just one example of how the Eisenhower administration was willing to liberalize their philosophy when it was necessary to bend it to achieve some political end. I like to think that Taft wouldn't have done that if he had been the Republicans' choice for President, but—

Q: Well, Eisenhower did organize his own water commission, as I recall.

A: Well, it wasn't a commission. We called it PACKRAT, the Presidential Advisory Committee on Water Resources, or something like that. It consisted of three secretaries, the secretary, I think, of Defense not of Army, Interior, and Agriculture. We called it PACKRAT because it took on such a broad mission and tried to cover all the bases. I was not directly involved because by

the time it was created I was at the Library of Congress, but I recall that their report recommended establishment of the Inter-Agency Committee on Water Resources. So then we were able to say they accomplished something. They changed the FIREBRICK to ICEWATER.

Q: Didn't amount to anything, so far as—

A: No, it wasn't that much of a change. Gene Weber had quite a hand in that committee as I recall, and it eventually led to the production of Senate Document 97, but by that time I was up at the Library of Congress.

Chiefs of Engineers and Water Resources

Q: Ted, I would like you to talk some more about your work within the Bureau of the Budget. The period is the mid-1950s. I want to explore that a little bit more with you, particularly the relations between the Bureau of the Budget and specifically between yourself and various people in water resources at this time.

Let's start with the Corps of Engineers. At this time General Sam Sturgis was Chief of Engineers. Can you give me a little thumbnail sketch, perhaps, of General Sturgis, what you might remember about him and his concerns about water resources?

A: Yes. I recall that Sam Sturgis followed Lewis Pick as Chief of Engineers, and I guess all I can say is we had very cordial relationships but not too many direct relationships with the Chief of Engineers. We dealt primarily with the chief of Civil Works and also the staff, and particularly Joe Tofani, who had succeeded Ken Bousquet as the person who was primarily responsible for the budget. We had very good relationships with Joe Tofani and with members of his staff. I knew them all very well, because I had been meeting quite a bit with the Corps' staff when I was in the Bureau of Reclamation. And so I don't have much recollection about Sam Sturgis.

Then, General Emerson Itschner succeeded him, and I was much closer to General Itschner, because-you remember, I was there in the Eisenhower administration, which was purported to be and had the perception of being a conservative administration-we didn't feel that Sturgis was really on our side.

Q: What does that mean?

A: By that, I mean that he was still the old Corps of Engineers which looked on itself as being engineer consultants to the Congress, and the Bureau of the Budget was looked on as a kind of a Johnny-come-lately on water resources. You realize that the Bureau of the Budget wasn't a part of the Executive Office of the President until 1939.

Somehow, General Sturgis was a much more remote figure. When General Itschner became chief, he seemed to be with us 100 percent and he was a very methodical person. When we said something, he immediately took steps to wholeheartedly put it into effect. He was methodical. Joe Tofani used to say how he read every letter that went out of the Civil Works Division. General Itschner was chief of Civil Works when we first started dealing with him and had the feeling that he really understood the position of the Bureau of the Budget much better than Sam Sturgis had.

Q: Well, let me ask you this, though. Sturgis can't defend himself, so let me see if I can try to defend him a little bit. I'm thinking about some of the material I've seen in Sturgis's files, which are voluminous, which we have in our archives.

There's an awful lot there, of course, in response to concerns that the Corps of Engineers might lose the civil works functions. You have the second Hoover Commission which, in the end, does not recommend that, but still and all, there is this concern and also perceptions that the Bureau of the Budget is trying to exert more control over the Corps' program than perhaps had been the case before.

So in other words if, in fact, Sturgis was a bit paranoid about what might be coming around the bend, particularly from other parts of the executive branch, was there some justification for it?

A: Yes, I guess there was, and I'm sure I would have felt the same way, if I had been the head of an agency in which I had a lot of pride. I hate to use the word, but the Corps is a little bureaucracy, and it has enjoyed a very close relationship with the Congress. In fact, the first few reorganization acts specifically eliminated from consideration any change in the civil functions of

the Corps of Engineers. That was in the reorganization act that was passed during World War II, I remember.

So when the Hoover Commission task force recommended a consolidation of the water resources agencies, even though it was later rejected by the full commission, Sturgis certainly had reason to be concerned. I'm merely talking about my perceptions as a staff man. And remember, at that point, I was merely the staff member on the Corps of Engineers' program, and it was a year or two later that I was promoted to be the staff person for all the water resources programs.

Q: Who were you reporting to at that point?

A: Well, I was still reporting, at that point, to Floyd Peterson. Then Floyd Peterson moved up to be General [John] Bragdon's staff person-

Q: Into the White House itself.

A: -as public works coordinator to the President.

Q: What was Floyd Peterson's position before he went into that position?

A: He was assistant chief of the Resources and Civil Works Division under Carl Schwartz, who was chief.

When Pete left to go upstairs, Charlie Warner-he's the old Corps hand from the Philadelphia District-moved into the position. At that time I was moved into a position where I was responsible for all the water programs, and someone else had all of the power programs in the Resources and Civil Works Division. We kind of split the TVA in a way, which was difficult. I had the Panama Canal and the Canal Zone government, and eventually the Saint Lawrence Seaway Development Corporation, as well as the Bureau of Reclamation, even though, of course, it and the Corps had power programs. But the power marketing agencies were in the power unit, and we all worked well together.

Anyway, relationships with the Corps always were good. I think I mentioned yesterday that we had the feeling that we always got what we wanted from the Corps, but then we didn't always get it through the Congress. I'm sure that

congressional staff members of the committees got help from the Corps' staff to get the Corps' program through, even if it was in opposition to the Bureau of the Budget's view.

One of the Corps' generals that I remember very vividly was Jack Person, who was director of Civil Works. He had come in, or maybe he went out to, the Ohio River Division. I always associate him with the Ohio River somehow. He had a very strong personality. One of the irreverent things I remember about him is when he would come in for a hearing, he always made a beautiful presentation because he had been educated in what we called Joe Tofani's "college." Then we would go to lunch with Jack and Jack would indulge himself in two double Martinis before lunch and Joe and I would kind of weakly follow on with singles. When we went back to the hearing Jack was right on the ball, the true Army general, and continued the presentation, and you never could see any trace of any influence of imbibing.

Some people could drink like that. My brother is one who could. He just could really hold his liquor and you never could tell he'd had a drink. He gave me my first drink of straight whiskey when I was about 15 years old. It made me feel so good that I didn't want to have a chaser.

So I had very good recollections of Jack Person and I was awfully sorry he had a heart attack. He had to kind of change his lifestyle somewhat, but he was a wonderful person, and we got along well. But my primary recollection, though, was with Joe Tofani who really held the whole budget of the Corps together and we knew we could count on him.

Now, with the Bureau of Reclamation we had a number of people whom we dealt with, and we were always fighting with them. Always arguing with them.

Q: Why is that?

A: Largely because the Bureau of Reclamation was primarily oriented toward irrigation at that time. They looked on power only as a source of revenue to subsidize irrigation. And at the same time in another part of the government, we were financing programs to restrict production and still the country was producing vast surpluses of crops. The Bureau of Reclamation refused to face up to the fact that this was a dichotomy in the federal programs. It was a bureaucratic agency fighting for its life. And the clash between the Bureau and

Corps was part of this fight-the Bureau did not have the political backing that the Corps had because of its limited focus in the West, and so it fought the Corps tooth and nail over projects like Chief Joseph and Lucky Peak and Hells Canyon.

The Bureau and the Corps eventually got together on the Columbia River basin and the Corps conceded Hells Canyon to the Bureau, but I think that may have been because the Corps knew that the project wasn't going to be built because of the pubic power ramifications of Hells Canyon, which eventually killed the high dam.

Q: Of course, the Corps also built more dams in California, though, beyond Pine Flat.

A: Yes, so they did. In California, starting with Pine Flat, the battle between the two agencies was intensified. Of course, the Californians egged them on, because the more federal money they can get in there, the less state money they'd have to put up to meet water demands. Eventually the state did have to come through with its bond issue and build the California water project.

But the Californians knew what they were doing, and I have great respect for the political abilities of people like Harvey Banks the way they played the Bureau against the Corps. They knew what they were doing, and they pretty much got as much as they could out of the federal government. Then when it became too hard to get enough federal money, they went on their own-it was originally their project, of course. But it has been costly, particularly when the Bureau of Reclamation tied up all that water for 50 years at a price of $3.50 an acre foot, and then fought to keep that low rate as new units were brought into the project.

Saint Lawrence Seaway Authority

Q: Ted, there are at least two or three major issues, water issues, in the Eisenhower administration that I would like to get into in some detail. You mentioned one of them already, the Saint Lawrence Seaway. It seems to me you were in a kind of interesting position in the Bureau of the Budget, vis-a-vis the Saint Lawrence Seaway. You were the contact for both the Saint Lawrence Seaway Development Corporation and the Corps of Engineers.

You must have been aware of the rivalry between those two organizations, that is, you know, the Corps at one time was hoping, and made its hopes known, that it would operate and maintain the seaway once the construction was finished, and evidently, according to what I've read, there was not a heck of a lot of love lost between a person like Sturgis, for instance, and the head of the Saint Lawrence Seaway Corporation at that time.

Can you shed any light on that?

A: Yes, but first let me say that even though this was the Eisenhower administration, I don't think it was so much Eisenhower that originated policy as the business interests that controlled the Republican Party. To me, Eisenhower was what I would call a warmed-over Democrat. I don't know whether he was a Republican or Democrat until they offered him a nomination from the Republican side. But he was what the Republican Party needed after 20 years of the Democratic Party's hold on the presidency. He was electable, which Taft may not have been in 1952.

So the partnership philosophy of getting projects and programs financed by nonfederal money was developed as a means of reducing the size of the federal government. The seaway was one of the partnership projects-the power phases of it were done by the New York State Power Authority and the Saint Lawrence Seaway Development Corporation was created as an independent government corporation to handle the navigation project. You remember, the Saint Lawrence Seaway has been discussed back as far as the Harding or the Coolidge or the Hoover administrations and maybe for a lot longer than that. I think the Bureau of the Budget had the feeling that they could get a better partnership arrangement there if we had a government corporation to do the navigation with the New York State Power Authority doing the power.

Up until that time, when the Corps built projects like John Day, which was in the mill then, and The Dalles project, the Corps did the power and the navigation and there hadn't been any thought of separating responsibility for the two functions. But then the Eisenhower administration decided that the next dam on the Columbia should be a partnership, and so Priest Rapids was to be done that way. We called it a partnership, but really the project was turned over to the public utility district. But I don't think there are any navigation locks.

Anyway, in the Eisenhower administration, Joe Dodge was the first director of the Bureau of the Budget and then Roland Hughes succeeded him. They were bankers, and they liked the idea of government corporations, and so the Bureau of the Budget never really considered that the Corps should have any role in the Saint Lawrence Seaway project, which was of an international nature, and we had to have relationships with the Canadians and the Canadian Seaway Authority.

So I guess if the Corps thought it was going to run the seaway, it was whistling Dixie, as they say, because, from my recollection, there was never any real consideration of the Corps on that.

Q: So the Corps did construct the seaway? I mean—

A: Well, the Saint Lawrence Seaway Development Corporation had a chief engineer, who was Ellis Armstrong, and he managed that project, not the corps.

I suppose I was maybe a Johnny-come-lately on the Saint Lawrence Seaway because originally the responsibility for the Saint Lawrence Seaway was being handled by the staff of the Commerce and Housing Division of the Bureau of the Budget. We had our own little bureaucratic struggles within the Bureau of the Budget, and I felt, of course, that the responsibility should be in Resources and Civil Works.

We already had responsibility for the TVA, which was a government corporation, and so when the decision was made to make the seaway into a government corporation, we fought to get it. We finally got it. I think the basic decisions had already been made, but Resources and Civil Works handled the budget each year. Reese Harrell, who was an expert on government corporations, with the GAO [General Accounting Office], became the controller of the seaway authority, and he was the one that we dealt with on the appropriations, and on setting the tolls, and all that.

But I never, never-I guess I'd have to go back and look at the record to see how the Corps fitted into that picture. But let me say that if there was any problem between the Corps of Engineers and the authority, it was nothing compared to the fight with the Coast Guard over the aids to navigation. This was a tempest in a teapot that went on for some time. We had a meeting with

the admiral who was in charge of the Coast Guard. He felt that the Saint Lawrence Seaway was trying to usurp the control of navigation there, and he said, "Why, if you let them put up these navigation markers in the seaway, they're going to want to move on up into the Great Lakes which are international waters." And he went on to say, "We'll have two systems of navigation in this country."

The Coast Guard, of course, puts up the buoys and the markers in all of the harbors that the Corps of Engineers improves, and I really got a kick out of that bureaucratic fight because it was such a small amount, amounting to maybe a million dollars. But the Coast Guard saw it as a real threat to its authority over the navigable waters of the United States.

McClellan-Kerr Waterway

Q: Interesting. Let me turn our attention to another issue, and this is going to introduce one of the most interesting personalities of the era, Senator Bob Kerr of Oklahoma. The issue that I wanted to first mention, though, or get your response to, was the development of what came to be called the McClellan-Kerr Waterway in Arkansas. Let me, just by way of getting your comments, mention to you an observation that's been made to me, and I've never been able to really document it, and that is that I guess it was in 1956 when the Interstate Highway Act was being considered, that the agreement was made that Senator Kerr would support the Interstate Highway Act in return for some support from some highway supporters for the construction of what came to be called the McClellan-Kerr Waterway.

Do you know anything about that? Could you give us some background?

A: No, I was not aware of anything like that, but I'm not surprised. I don't remember in which act the Arkansas River Waterway was authorized. Do you remember which year that was authorized?

Q: I think that goes back to the late '40s, actually.

A: Yes, it was an authorized project when I was in the Bureau of the Budget.

Q: '48, something like that.

A: That's what I remember and so each year the Corps came in and asked for money and each year the Bureau of the Budget turned them down. And I shouldn't say "each year," because I was only there for four years, but we did turn them down. Then the Congress finally put in $1 million to start the project, and the Corps started by buying some land and building an access road, or something like that, the way they would do, and started the design.

When that came up in the budget for the second year of construction in the budget, and the Corps was asking for $5 million, the way the construction progression goes: $1 million, $5 million, $10 million, $100 million. This became a policy issue. Should we continue this project? We didn't think it was economically sound, I should say the staff didn't think it was economically sound, and it had been started in opposition to the Eisenhower no new start policy. It was felt that the only way you could hold this program within the budget was to eliminate any new starts. The total Corps program at that time was about $450 to $500 million, but the Corps program plus the Bureau program and the SCS program amounted to maybe 2 percent of the budget, which is a lot bigger share of the budget than it is now. That was before the social security trust fund was incorporated into the budget.

So a policy decision was made on the second year of construction on the Arkansas Waterway. We just zero budgeted it, and, of course, that was in the budget that went up to the Congress. I think the Congress put it back in, and the Corps continued the work.

And then I recall that in the third year there was a big meeting in the White House at which I wasn't present but Senator Kerr came in-probably with Senator John McClellan and a lot of power from the Hill, plus a lot of local people-and they met with the President himself. I'm not sure whether Sherman Adams had been released at that time or not. You remember the Vicuna Coat scandal?

Q: Yes.

A: Anyway, after the White House meeting, we got the word that from then on we were going to fund the project. I don't know about this deal with the highway interests that you speak of. I've told you all that I can remember about my involvement with the Arkansas Waterway which was that we recommended against it as long as we could.

Rivers and Harbors and Flood Control Act of 1958

Now, at about that same time, there was another really major issue that came up to me and that was the omnibus bill that eventually became the Rivers and Harbors and Flood Control Act of 19%. There hadn't been a rivers and harbors bill for a few years, and the traditional two-year cycle had been broken, but in 1957 the Congress passed a bill, and because it was the first bill for several years, they put a lot of projects in it on which they didn't have completed reports. They also had a number of projects in the lower Mississippi valley which they were going to add to the MR&T project, which meant that the federal government would pay all the operation and maintenance costs.

And these projects-I think it was Boeuf and Tensas bayous, probably in Louisiana or Arkansas, and several other projects really were land reclamation projects. We were still operating under the provisions of A-47, or, you might say, trying to operate under these provisions, even though there was little political support for them. So the staff still would object if an agency didn't follow those provisions which called for local cost sharing for land enhancement projects.

And so, when this enrolled bill came to the White House for signature, proposing authorization of what seemed like a very large amount of money, it was carefully reviewed. There were lots of projects without reports, or with district engineer reports only, and no Board of Engineers report or no division report, and definitely no Chief of Engineers report. And then there were a number of them where they had a Chief of Engineers report and the report was still sitting on my desk for comments as to the Bureau of the Budget's position. I was able to get most of those out, but still, there were a lot of them that didn't have a House document number-hadn't been published.

It was obvious that enactment of this bill would be breaking the President's budget policy. At the same time, the bill for the Soil Conservation Service, which really got the Soil Conservation Service into small flood control projects with both feet by liberalizing the cost sharing, was under consideration.

Modification of Public Law 566, The Hope-Aiken Act

Q: So you're talking about the modification of Public Law 566, the Hope-Aiken Act.

A: I'm talking about the amendment which eliminated the cost sharing on flood control.

Q: Yes, that's what I was asking about.

A: The Hope-Aiken Act, Public Law 566, had cost sharing, and in 1957, they were considering removing that cost sharing on small reservoirs. At the same time, the Bureau of Reclamation was trying to get its Small Reclamations Project Act through, and those three bills moved down through the congressional committees and came up to us as enrolled bills for advice as to whether the President should sign them or veto them. Our staff took a position against all three of those bills, because of our feeling that they were all liberalizing federal policy and would result in increasing demands on the federal budget, even though on the small reclamations project bill there was going to be repayment, it would be without interest.

So our staff recommended that all three of these bills be vetoed. Of course, the Bureau of the Budget also asked all of the agencies for comments on all three enrolled bills. I didn't handle this directly, but our Office of Legislative Reference, as it was then called, handled that routinely. That office was headed by Roger Jones, and he gave us an opportunity to review all of the comments before he made the Bureau of the Budget's recommendation to the President.

Well, interestingly enough, the Bureau of Reclamation recommended that both the SCS's bill and the Corps' bill be vetoed, and each agency did the same: recommended that the other two be vetoed. One of the things I remember particularly was that the Corps, in its comments on the SCS's bill said, "This act would take away the one significant indicator of the value of a flood control project: the willingness of the beneficiaries to pay a share of the costs."

Well, I took great delight in using those very words in drafting the President's veto message on the Corps of Engineers' act. I think those words must have been written by either Gene Weber or Howard Cook.

But anyway, the omnibus bill was vetoed on the grounds that they didn't include reimbursement for land enhancement in the flood control projects, which really hit those Louisiana and Arkansas projects hard, and they had all these projects that they didn't have complete reports on.

Do you remember the book that Elmer Peterson wrote—

Q: *Big Dam Foolishness.*

A: *Yes. Big Dam Foolishness*. Well, Elmer Peterson went in to see the President about that time and gave him a copy of the book. The President was very much impressed by the book so the President vetoed the Corps' bill, and he vetoed the Bureau of Reclamation's bill, but he signed the Soil Conservation's flood control bill and it became law in 1957. Neither of the vetoes was overridden.

The next year the Corps' bill, with some modifications was passed again, in 1958. Many of the reports had been finished. I had cleared my desk and got all the comments on the reports out, and so a lot of the objections because of the lack of completed reports were eliminated. But there were still some they didn't have reports on, and they were left out of the new bill. But no change had been made in land enhancement. So the President vetoed the bill again. I don't have as vivid a recollection of that, but we felt that we were breaking some new ground, vetoing a Corps of Engineers' authorization bill for the second time.

Everybody said, "It's never been done before." As a matter of fact, it had been done, and it was done many times in the 19th century. There's one thing that people forget, that until the Republican Party was formed in 1856 and succeeded in electing a President in 1860, Abraham Lincoln, the President had rarely ever agreed with the Corps, had vetoed most of the rivers and harbors bills, and they were passed over his veto. It wasn't until the liberalization of the federal programs by the Republican Party that Presidents agreed that undertaking internal improvements was an acceptable function for the federal government .

Most people don't know that. I'm indebted on that, I might say, to some research that Henry Caulfield did when he was at Resources for the Future. I opened my eyes to the origin of the Republican Party, and I did some research on the history of federal participation in public works later on when I was up at the Library of Congress.

But it's an interesting facet of our political history that the Republican Party really was the liberal party. My family, I'm sure, were all Republicans. I was named "Theodore" because my mother and father had such a great respect for Theodore Roosevelt.

Now we've had a complete changing of the political spectrum, starting with Taft when he changed the nature of the Republican Party and when Teddy Roosevelt with his Bull Moose campaign was defeated.

Q: Let me continue on that for a second, because actually, while on the one hand, of course, the Eisenhower administration was trying to exert some control over the enormous costs of water resources projects, on the other hand there was some legislation passed in the 1950s that, in some senses, expanded the federal role in water resources. I'm talking specifically about legislation involving coastal engineering projects and also legislation involving water supply, the 1958 Water Supply Act.

I wonder if you might give us a little bit of background on either one or both of those acts? I'm particularly interested, frankly, in the Water Supply Act, because that seems to be something that is of some interest to us today. Did you get involved in any of the—

A: The Water Supply Act of '58 was Title III of this bill that I was talking about that was vetoed, and that was one of the reasons that we vetoed it twice. That was one of the objections, because it opened up a whole new area. The Bureau of the Budget, at least, was dead against it, and the President supported us.

Now, I have to say that, on the third try, they took out more projects and the recommendation on cost sharing for changed land enhancement. The President eventually signed the bill, but that was after I had left the Bureau of the Budget. But Title III stayed in the bill and became law.

Legislative Reference Service, Library of Congress

I think I ought to tell you how it came about that I left the Bureau of the Budget to accept the position of senior specialist in Engineering and Public Works at the Legislative Reference Service at the Library of Congress. The reason I got that job was they had interviewed Howard Cook, and also Eugene

Weber, to fill the position that Charlie Curran had held before he went to work for the second Hoover Commission. A fellow named Wally Vawter, whom I never met, filled in for Curran while he was at the Hoover Commission. Interestingly enough, they had both been in the Bureau of the Budget before moving to the Library of Congress. When Curran didn't want to come back to the position they had held for him and Vawter had already left, they had to fill it.

Howard Cook called me up one day to tell me about it. He said they had invited him to come up and talk to them about the position, and he said something like, "I don't think I want the job because I think I can do more good at the Corps." Howard really felt that he was helping to reform the Corps' policies. Howard was a wonderful person with great integrity. I think I've mentioned that I'd worked with him when he was in the Office of Land Utilization in the Agriculture Department. The Corps was lucky to be able to hire him when he was booted out of Agriculture when Ezra Taft Benson became secretary.

Anyway, Howard asked me if I would be interested in interviewing for the position. I told him that I hadn't really thought about it, but if it were a promotion I might consider it. Then a few days later Gene Weber called me and told me that he had been up there talking to them, but that it was not the kind of job he wanted. You remember, Gene was involved in the International Joint Commission, but I don't know whether he was a commissioner yet. However, he had a very public image and at one point had received a very important public service award. I think he felt it would be a step backward in his career. I think he said that he was not the kind of person who could sit at a desk and do research. Then he asked me if I would be interested. And I gave him the same answer I had given Howard. So Howard and Gene apparently gave my name to Ernest Griffith, director of the Legislative Reference Service, who invited me to come up for an interview. And when they offered me the job, with a promotion, I left the Bureau of the Budget to join the staff of what is now the Congressional Research Service. So I was up there when the omnibus bill finally was enacted with a lot of those projects out.

One of the ironic things that happened over the next few years in my role at the Library of Congress was that Senator McClellan and Senator Ellender and various other members of the Congress whose projects had been curtailed in that 1958 act asked for my help in getting what they wanted reinstated. The

most egregious of these requests was for help in taking the cost sharing out of the land enhancement in the Boeuf and Tensas bayous project. I felt that it was kind of ironic that here I had been one of the people fighting to keep certain things out of the federal program, and now I had to help put them back in because it was my job to help members of Congress.

But I have always looked on my role as primarily a staff role in which you do what it's your responsibility to do. I guess that's why my philosophies never became imbued into the policies until much later.

Q: Let me just ask you, before we get off the Bureau of the Budget, one last question. You've been talking about your relations, and the Bureau's relations, with various Corps personalities, but there are some people whose names have not popped up and, in a sense, they're notable by their absence. I'm talking, in particular, about people in the Department of the Army, as distinct from the Corps of Engineers.

I think, by this time, Dick Hertzler was already over in the office that became the Office of Civil Functions. That particular responsibility shifted among various offices in the '50s and early '60s in the Department of the Army, so it depends on what year you're talking about. But the question is, did, in fact, to your knowledge, the Department of the Army try to exert some control over the Corps' civil works functions, or was the relationship really between the Corps and BOB as sort of short-circuiting the Department of the Army?

A: Dick Hertzler was another refugee from Ezra Taft Benson when he reorganized the Department of Agriculture, and was our primary contact with the office of Civil Works. We had a lot of contact with Dick Hertzler, but, frankly, Dick did not have the power or the knowledge that Joe Tofani had. Dick was a wonderful person, and I liked him a lot. We had been friends for years before he went to the Department of the Army, and we always tried to work through him, but he had Dewey Short as assistant secretary. So the top-level relationships were between Bob Merriam, assistant director of the Bureau of the Budget and Dewey Short. But when it came down to getting something done, we relied much more on Joe Tofani. Dick had the role, I think, of trying to rationalize decisions that were being made by powers that were more powerful than his particular office. That was the way I looked at it. Dick was in a difficult position because he basically agreed with us, and we had pretty good rapport with him and Howard Cook, but when it came down to the decisions,

I sometimes felt that they were just voices crying in the wilderness, trying to bring more cost sharing into the course of programs, and trying to bring more conservative cost-benefit analysis and better economic analysis into the program.

And Gene Weber was another one we dealt with on policy and he seemed to have somewhat more, if you want to use the word, "clout" in the Corps. He eventually became an assistant chief of Civil Works, I believe-one of the few times that a civilian has reached that stage.

So I didn't have lots of contact with Dick Hertzler, but it struck me that there wasn't any real power there, and I don't think he exercised much control over the Corps. When we really wanted to get something done, we just had to go through Joe Tofani.

Q: Okay, well, I think it's time to turn our attention to the Kerr Committee, unless you had something else you wanted to cover.

A: No, I had first met Senator Kerr when the Bureau of the Budget had testified before his subcommittee on A-47. I think there were several attempts in the Senate during the mid-50s to liberalize federal water policies. I am thinking of Senate Resolution 248, and Senate Resolution 281, but I can't remember which Congresses. They were introduced or adopted in an effort to counteract A-47, because A-47 was still on the books even though everybody had disavowed responsibility for it. Because it was still on the books, the Bureau of the Budget could use it in reviewing reports. So the Senate-this was the Public Works Committee-was trying to impose its views, which were toward the liberalization of policies with respect to recreation and the environment. At that time they wanted nonreimbursable allocations of costs for such environmental programs as providing water for dilution downstream from reservoirs. Dilution of—

Q: -pollution?

A: Yes, pollution. It was looked on as a way to get more projects. You provide space in reservoirs for water quality storage, which could be drawn down to dilute pollution. It was proposed as another nonreimbursable allocation that could help to justify a project.

I think Senate Resolutions 248 and 281 were in separate Congresses. I think 281 came first, and then 248, and they both were attempts to liberalize policy. The Bureau of the Budget testified against them, although these were not laws. These were merely Senate resolutions which the President didn't have a view on, but we were consulted, and Senator Kerr seemed to delight in attacking the Bureau of the Budget; Bob Merriam stood up beautifully against Senator Kerr, and there was a lot of interesting repartee. Senator Kerr was always a great one to ask his staff for a dictionary and quibble about some word.

He was a very well-educated man, as well as a brilliant man, and I can remember one exchange where Kerr said, "Well, this word means so-and-so to me," and Bob Merriam said, "Well, Senator, I have to accept the dictionary's definition, as long as it's a Merriam-Webster dictionary." Bob Merriam, as well as his father, was very much involved in public administration. I enjoyed working with him. Incidentally, Bob died just a few months ago. I had been briefing Bob on water policy, so he was well versed on the issues and he had several sharp clashes with Bob Kerr and Senator Ellender. It soon became evident that Kerr and Ellender were not really very conversant with the issues we were talking about. It was all very theoretical to them, and they had been prodded by staff people to hold the hearing, and when the staff people weren't there, they weren't able to make much of a case at that particular time.

Senate Select Committee on Natural Resources

Anyway, about a year after I went up to the Library of Congress, I was very surprised to get a call from Don McBride, who was Senator Kerr's principal staff man in the water resources area, asking if I would come over and talk to Senator Kerr about serving as staff director of the Senate Select Committee on Water Resources.

Q: Okay. Now, just to get the chronology straight, in April 1959 you had Senate Resolution 48, which, of course, calls for these studies of water resources and some 20 months or so afterwards, I guess it's 1961, is when the report is finally submitted. Okay.

A: Well, let me go into the background of that. I should have mentioned that first. Senate Resolution 48 was introduced by Senator Mike Mansfield. It stemmed

from the fact that the President had vetoed the Army Corps of Engineers' authorization-the bill that eventually became the Rivers and Harbors and Flood Control Act of 19%. The President had vetoed it twice. The revised version that eventually became law was passed at the end of the session. In addition, the President had vetoed the Bureau of Reclamation's small projects bill and the expansion of the water pollution control program. This was a big issue we haven't mentioned, but it was a big issue through the '50s. And the President, I think, had vetoed the Civil Functions Appropriations Act.

This was near the end of the Eisenhower administration, and I think some people on the Hill decided they had to make a record in the water resources field to help in the 1960 election. And the studies authorized by Senate Resolution 48, which didn't have to go up to the President for signature, were going to be used to provide the ammunition they needed to beat the administration over the head in the 1960 elections.

I didn't really know much about it when I got the call from Don McBride. Don McBride was the former executive director, or maybe they called him the executive vice president, of the National Reclamation Association. Then, later, he had been state engineer of Oklahoma and had come to Washington when Bob Kerr was elected to the Senate. I got his call while I was at a civil engineering meeting out in Cleveland, which is why I remember it. When I got back from Cleveland, I went over and met with Senator Ellender and Senator Kerr. I remember Senator Kerr saying, "Mr. Schad, we've been talking about you as if you were a sack of meal or a sack of flour-or wheat or something-as if you were an inanimate object, and we wanted to meet you and see if you meet our specifications to run this committee."

Allen Ellender didn't say very much. He was rather laconic, and in some ways he was more political than Bob Kerr. Anyway, nothing at all was said about my political affiliation, Kerr obviously remembered that I had been before him representing the Bureau of the Budget, and so he knew where I had come from. But I think he relied also on Don McBride's knowledge of me. We had a little talk at the end of which I agreed to take the position of staff director for the Senate Select Committee on leave from the Library of Congress.

When Senate Resolution 48 was passed, it was co-sponsored by Senator [James] Murray of Montana, and I think it had been assumed that Senator Murray would be the chairman of it. Senator Murray was chairman of the

Senate Interior and Insular Affairs Committee, Dennis Chavez was chairman of the Public Works Committee, Allen Ellender was chairman of the Agriculture Committee, and Warren Magnuson was chairman of the Commerce Committee; and they were all going to be members of the Select Committee because it cut across all of their responsibilities. But Senator Murray had medical problems-I don't remember just what it was-and Clint Anderson took over the responsibilities of the Interior Committee.

When it was found out that Senator Murray would not be able to serve as chairman, and then since Senator Kerr was chairman of both the Rivers and Harbors and Flood Control Subcommittee of Public Works and the Subcommittee for Civil Functions of the Appropriations Committee, he seemed to be a natural person to serve as chairman. I don't think he had had anything to do with the passage of Senate Resolution 48, and he probably didn't even know about it until it was passed because it came out of the Interior Committee. It was also felt that if one of the four full committee chairmen took it, there might be a violation of the rule about how many committees you can chair in the Senate, but I am not sure that rule applies to select committees.

So that's how Senator Kerr got to be chairman, and to show that it was going to be a bipartisan committee, Senator Tom Kuchel of California was made the vice chairman. There were a number of powerful senators on the committee in addition to the four chairmen: Henry "Scoop" Jackson, Magnuson, and, of course, Senator Murray, who was ex officio, but he never came to the meetings. On the Republican side, Milt Young and Francis Case. Case was very much involved in water resources, having been one of the sponsors of the Case-Wheeler Act back in the '30s.

Then there were some of the newcomers. Well, Clair Engle was a newcomer in the Senate, but he had served a long time in the House, and Phil Hart and Gail McGee and Ted Moss. So we had some really powerful committee chairmen, and then we had some new, younger senators who were a joy to work with because they were so open with me and relied on me to educate them about water resources.

Q: There seems to be a strong Western representation on the committee.

A: Yes, very strong Western representation, but we had Phil Hart from Michigan and Hugh Scott of Pennsylvania. I should also mention Thomas Martin of

Iowa. But otherwise, it was all Western, but that's where the primary interest in water is in this country.

Q: How about the Southeast, we've built a lot of projects there?

A: No. Nobody from the Southeast. And we had two from California, two from New Mexico, and two from Washington state, so it was not well balanced geographically. Anyway, I accepted the position but remained on the Library's payroll and I didn't have any commitment to support any particular policies or anything like that. My role at the Library was to serve members and committees of the Congress, particularly the Public Works and the Interior Committees of both Houses and their members, so it was quite natural for me to take on the responsibility.

The director of the Legislative Reference Service, Ernest Griffith, didn't want me to go because he said he needed me, but didn't stand in my way because by taking the position I was, in effect, serving the committees which I was responsible for serving.

So I went over to work in what was then called the New Senate Office Building, the first occupant of Room 3206 still on the Library's payroll, but the Library was reimbursed by the committee. The Library was very particular about that, and I think even when I traveled for the committee, the Library had to buy my tickets and the committee had to reimburse. The Library was very particular about any staff member not receiving any outside compensation, even from another government agency.

I started to work for the Senate Select Committee about May 1959 and I found that Clint Anderson had already taken a leading role in the planning for the committee's work. He had been in touch with Ed Ackerman, the Ed Ackerman who had been at the Bureau of the Budget. I don't know whether this is a fact or not, but I believe that if Ed Ackerman had been willing to take the position of staff director, Clint Anderson might have accepted the chairmanship. But Ed Ackerman had been appointed as executive officer of the Carnegie Institution, which is a very prestigious position; he couldn't be expected to consider going to work on the Hill. I have a feeling that that's another reason that Senator Kerr was made the chairman of the committee.

They're all gone now. Nobody can ever prove or disprove that and I doubt if anybody else but me remembers or cares about it.

But Ed Ackerman had worked out a rough outline of how to attack the problem. Of course, it was very thoughtfully and professionally done. It was, I might say, very academic, remembering that Ed Ackerman had been a professor of geography at the University of Chicago. It was a good program; it was to be accomplished in two phases. The first phase was to lay the groundwork and develop all the physical and economic information, and the second phase was analytical.

This plan was given to me by Senator Anderson and it looked good to me. Ed Ackerman was a friend of mine and he met with me several times to discuss his ideas. At first I pretty much worked as an individual on this because I was used to working as an individual. Later, I got a gentleman with whom I'd worked in the Interior Department named W. G. Hoyt to assist me. Hoyt was an old-timer with the U.S. Geological Survey who had been the executive secretary of the Water Resources Committee of the Interior Department, and I had very close relationships with him on all the work I did through the FIARBC.

He was retired and had been living up in Connecticut but had just moved back to Washington, so I took him on as a consultant. I think we paid him about $25 a day, because he was a federal annuitant, and the rule was that you deducted the amount of their federal annuity from their normal pay.

I also took my assistant from the Library, Barbara Jibrin, over with me, and Senator Kerr assigned Paul McBride-not Don McBride, but Paul McBride from his staff-to be the administrative man for me. I think that Paul McBride was supposed to keep an eye on me, but he was not the kind of a person that was very intellectual in the water area; he was really the only committee clerk, so we called him the "Chief Clerk."

We also had a secretary, Maggie Duckett, who had formerly worked for Robert Kennedy on the staff of the Labor-Management Relations Committee. She was a very good secretary. We also had another secretary, and that was the extent of the staff. We didn't have a lot of money. I think the resolution provided only $175,000 for the first year, and we were supposed to get help from the federal agencies. I was able to enlist the aid of Abel Wolman, Gilbert White,

and Ed Ackerman as consultants, and I think we were able to pay them $100 a day.

That gave me a lot of intellectual power. I don't think we could have done what we did if it hadn't been for those three gentlemen helping me. We met several times, and they met with the committee as a group once or twice and with the chairman and me individually several times.

I started with the Ackerman program and developed it into something that I felt would be easier for the senators to understand-a little bit more practical covering federal programs in the first phase and problem areas in the second phase. Most of the studies were done by federal agencies in response to requests made by the committee, or I should say, by the chairman. At one point, Senator Case had an assistant that he wanted to get involved with us, and so we did have a gentleman named [A. M.] Eberle, from South Dakota help us with a report on weather modification. Later-I don't know whether the Corps put him up to it or not-1 was asked to appoint Herb Gee, a former Corps of Engineers officer who had left the Corps with a lot of publicity because he couldn't get promoted, or something like that. He had a consulting firm down in Palm Beach, or West Palm Beach. He was named as a consultant, I think, on the recommendation of Allen Ellender.

Q: Is that G-e-e?

A: Yes. But Gee and Eberle were kind of on a different level than the first three consultants that I mentioned. They came to some meetings but didn't get involved with the overall program, which had already been adopted by the committee. We went through that whole list of studies one by one. I won't enumerate them now because they were all published as committee prints. We made a special effort to get the Government Printing Office to change their standard format for committee prints which was 6 x 9. We had to pull a few strings to get the Joint Committee on Printing to agree that we could get those printed up in a larger format, 8½ x 11. You just can't believe how much red tape had to be cut just to make that one little decision. It was almost as if we were undermining the foundations of the Capitol to make that change. I think Senator Kerr had to take it up with Carl Hayden. There have been other slick-paper committee prints that have been on that format.

Q: Why were you so interested in getting the size changed?

A: Because we wanted them to stand out as different and more important so people would pay more attention to them. Both Gilbert White and Ed Ackerman felt one of the problems is that the Congress really doesn't really understand the importance of proper management of water resources. The whole thrust of Ackerman's original program was to lay out an academic background on the theory of water resources, as a way to educate decision makers.

So, at one of the first meetings of the committee, we had the Geological Survey make a presentation with attractive charts showing all the different aspects of water resources-of groundwater, water quality and quantity, and so forth. These charts would not have looked good in a 6 x 9 format, but they looked good in the larger format, and that became Committee Print Number 1, and that is why the decision was made.

Maybe it wasn't all that important, but Senator Kerr wanted it done, and so we did it that way. And I'm glad we did because it set our work apart a little bit. But you're right, maybe it wasn't all that important. But why did they make such a big deal out of it? I guess I have a stubborn streak in my nature, and when they said, "You can't do it," I said, "Well, I think we will do it." We eventually went to Carl Hayden. He was president pro tern of the Senate, but he was probably also chairman of—

Q: -the Joint Committee on Printing?

A: I don't know whether it was the Joint Committee on Printing, or the Committee on Administration of the Senate.

Anyway, the reports were printed in the larger format and lots of people liked them. Most of the reports were prepared by the federal agencies. These were the reports on the first phase, developing the background for the analyses in the second phase.

Q: So in other words, the Corps of Engineers actually prepared the report on flood control, or—

A: That's right. It was Howard Cook, and he did a wonderful job, and I think he prepared one on navigation also. At least he was my contact person. Similarly in the Interior Department program, there were reports on Reclamation, and

Fish and Wildlife, and the Park Service. I can't remember who prepared the one on Alaska.

Water Supply and Demand Study

The principal new idea that I put into the program was the idea of developing the water supply/demand relationship. It was not an original idea with me. A gentleman named Doug Woodward, who was on the staff of the Geological Survey, had written a paper for the Army War College on the supply/demand relationships for water. He did it really for the whole country, and, of course, it does show there's plenty of water in the United States.

I had read that paper, and the idea kind of intrigued me, and so I got the idea that this would be a good focus for the committee's efforts to develop water supply/demand relationships for the individual river basins to show where the shortages were showing up.

We divided the country up into 22 water resource regions. Working with people from the Department of Agriculture, we divided the whole country into river basins, but we had to do it by county lines because all the economic data which drive the demand side was prepared by counties. The Geological Survey set up a whole section for me, headed up by a wonderful hydrologist named Roy Oltman, with a staff of five or six people to work on hydrology for the Senate Select Committee. We could have never done what we did if it hadn't been for that group, as well as other groups.

We had a committee of representatives from the federal agencies to help with the coordination of the studies. Howard Cook was the representative from the Corps of Engineers. Carl Brown from the Soil Conservation Service represented Agriculture. When I saw that I would need more help to put all this together, Ed Ackerman, who had been chief of the water resources program at the Resources for the Future before he went to the Carnegie Institution, put me in touch with Resources for the Future. They had just given a grant to an economist from the University of New Mexico on sabbatical named Nathaniel Wollman to work on water supply/demand relationships. Nat Wollman was a most unusual person in that he was-1 don't know whether to say indefatigable or what-but you could not discourage him. He was in Washington for only a year, or maybe two years, to work on this project, but he was convinced that

it could be done. He sat in on the meetings with federal agency representatives to help with the coordination. People like Nat Wollman and Howard Cook were really the indispensable glue which helped me pull all of this together.

Out of it we developed a water supply/demand study which was going to be done by Resources for the Future with the aid of the federal agency committee to provide the data from their agencies. Of course, this was wonderful for Resources for the Future, because otherwise, they'd have had an awful time to get all this data together, and really, we got hundreds of thousands of dollars' worth of effort out of the federal agencies.

So we developed that study as the means to pull together all of the background studies contemplated in part one of the original Ackerman outlines. The water supply/demand relationship study hadn't been in the original Ackerman plan of study.

Q: Did you get into any questions of urban water supply?

A: Yes, we had a study on municipal water and we had a study on pollution abatement, so we got into urban water problems, which were handled at that time by the Public Health Service under the new Department of Health, Education and Welfare.

Anyway, the water supply/demand study was the first of the really analytical studies, but the rest of them I left for phase two, because we had enough of a problem to get these 20 or 25 background studies pulled together.

I'll never forget the way Nat Wollman helped pull together those meetings with the federal agency people. And the Geological Survey staff was wonderful also. They said, "Yes, we can do it." Of course, they were hydrologists, just looking at the strictly hydrological part of it.

But some of the other agencies, particularly the Public Health Service which handled water pollution control, was very negative. Their representative was a good friend of mine, Melvin Scheidt, and he was very much concerned about some of the short cuts that we were taking in putting together this water supply/demand study.

But we went ahead, and we published the agency studies as we went along. During the same time, the committee held 23 public hearings in 21 different states. The way we decided where to have hearings was whenever a senator asked us to have a hearing, we would agree to have a hearing. For that reason, the hearings were almost all held in states where we had members, and we kind of left the Southeast out of it. We didn't leave New England out of it, however, because Senator Edmund Muskie asked us to have a hearing in Maine and Senator John Kennedy asked us to have a hearing in Massachusetts. And Hugh Scott, of course, was a member of the committee, so we had one in Philadelphia. So we had three hearings in the Northeast, but we didn't have any in the Southeast, although we did get to New Orleans.

We had this series of hearings during the fall and winter of 1959-60 and that pretty well occupied my time while the agencies were working on the background studies. We used a military air transport plane which was assigned to us, and we flew all over the country. During those trips I found Senator Kerr to be a very interesting and stimulating person to work with.

One of the things that happened is that my father had died just before I started working for the committee, and this kind of leaves a gap in one's life. So Senator Kerr became a very fatherly figure to me. He had one faculty that my father had. My father could look at a column of numbers and add them up in his head. I'm talking about a column of numbers with four digits or something like that. He could just somehow add them up in his head. He never could understand why people had trouble adding each column of numbers and carrying the tens over to the next column and all that business that they teach you in grade school, because he seemed to be able to add columns of numbers by inspection. And Senator Kerr could do the same thing.

Senator Kerr used to take the staff to lunch sometimes and we'd have maybe 10 or 15 people with many different entrees. When the waiter would bring in the check Senator Kerr might take one look at it, and he didn't look and see who had what or anything like that, but he'd look at the total, and he'd hand it back to the waiter and say, "There's a mistake here." And the waiter would take the check and add it up again, and he would come back and say, "I'm sorry, Senator, the cashier made a mistake." And there had been a mistake of a dollar or so in adding up a check which came up to $50 or $60. And Kerr would pay it, and maybe give the waiter a $20 bill for a tip. He always paid cash; I never saw him use a credit card.

So Kerr had that kind of a brain. I guess we could all train ourselves to do it, but we don't, and it's probably not important now. But this was one of the characteristics that reinforced my feeling of respect for Senator Kerr, especially because my father had the same ability.

So I really had a lot of loyalty to him, and the relationship was reciprocal. But all of his staff felt the same way about him and felt close to him in a personal way. He had a press assistant named Malvina Stephenson who traveled on all these trips with us and who eventually, I think, wrote the first draft of his book, *Land, Wood and Water*. She was an ex-newspaper person from Oklahoma, and there was a bitter feud between her and Don McBride as to who was really closest to Senator Kerr. Everybody always wanted to feel they were his number one assistant. Everybody on the staff.

I didn't feel quite that way. I knew I wasn't, and I was still on the Library payroll. I got a big kick out of traveling with him to the hearings. We traveled on a twin-engine Convair plane provided with a pilot and staff by the Military Air Transport Service. It had tables in the back where two people could ride backwards, and Senator Kerr always took one of the rear-facing seats. On one of the trips he asked if anyone played bridge. From then on we started to play bridge on the airplane trips. You'd think we would have been working, preparing for the next hearings, but no, he wanted to play bridge. It was always Senator Kerr and Malvina playing Senator Hart's assistant, Muriel Ferris, and me. I had played a lot of bridge when I was growing up, but hadn't played much after I got out of college. And I don't think I was a very good player. I don't think I even knew Stayman. But inevitably it was just like sometimes you get a streak of luck. Maybe Muriel Ferris was good enough to make up for my shortcomings, but anyway, we almost always beat Senator Kerr and Malvina, largely because Malvina wasn't a very good player. This really irritated Senator Kerr, and we wouldn't be off the ground in the airplane on the next trip when he would get out the cards, because he was just determined to beat us. I think he even got Malvina to take lessons.

This rivalry even extended to when we had a staff picnic for everybody at Muriel Ferris's house in McLean. All of the staff and their families were invited, and we had a picnic one Sunday in the summer. When we got there the first thing Senator Kerr wanted to do was play bridge. So we started in at 11, 00 o'clock, or whenever we got there in the morning, and we played all day, and he lost all day. My wife was furious and said I should have circulated with

people and been more sociable. But Kerr was determined to avenge himself, and he never was able to. I guess I never knew how to win friends and influence people by letting them win.

Kerr was really a good bridge player. We were just playing for fun, and the cards were running against him. It was just a friendly rivalry, and it was relaxing. I still like to play bridge because it gets your mind intent on something other than things that you may not like to think about.

So I got along very well with Senator Kerr, and he had a great respect for me and what I was doing. When he got the draft of his book, *Land, Wood and Water*, he had a lot of technical questions, but he didn't ask me to help review it. He said, "Ted, you just can't take time. You've got too much to do." So I found someone else well versed in water resources that he contracted with to review that book for accuracy. It was a paid contract. Kerr was not at all stingy; when he asked somebody to help him, he was willing to pay them.

Q: Well, who actually, then, wrote the final book?

A: It was autobiographical, but he gave credit to Malvina Stephenson and Tris Coffin, as editors.

Now getting back to the Select Committee studies. Let me tell you one other thing about how Kerr operated. We wanted the Census Bureau to break down their population projections by river basins and by states because we needed them to work on the water demand side of water. The head of the Census Bureau was Conrad Taeuber, and we met first with staff and then with him to tell them what we wanted. They finally said they couldn't do it, that it would be very time consuming, and that they never did it that way, and if we wanted it done, we'd have to sign a contract that would probably cost about $50,000 or $60,000.

When I reported that back to Senator Kerr, I told him that I didn't think we could spend that much money, and if we started to pay one agency, we'd have to pay the others. And he said, "Who did you say was the head of that agency?" and **I** said, "Conrad Taeuber." And he said, "That's under the Department of Commerce, isn't it?" And I told him that it was.

A week or so later, I got a call from Conrad Taeuber, and he said something like, "We have now reevaluated your request and decided that it would be a very interesting study for us, and we will be able to do it just the way you wanted it done." About a week or two later, the nomination of Louis Strauss to be Secretary of Commerce was voted on in the Senate. Louis Strauss, as chairman of the Atomic Energy Commission, was one of the architects of the Dixon-Yates fiasco and was anti-public power; he certainly had nothing in common with Senator Kerr who had been a public power man from way back. And Kerr voted for his confirmation.

I don't know for sure whether there was any connection or not, but the vote seemed unusual. Nobody expected Kerr to vote for confirmation. Of course, Strauss was not confirmed, so it didn't make much difference.

Q: Well, it's an interesting anecdote.

A: There were a lot of little incidents like that which I look back on with a lot of interest because it was my first close association with political figures. Of course, having been in Washington for 13 years I knew how they operated.

Getting back to the putting all of the federal agency contributions together in the water supply/demand study, we hit a roadblock in the Public Health Service. My friend Mel Scheidt said, "We just can't do it. You're making some gross assumptions here that we can't substantiate." After a lot of arguments they agreed to help us by paying George Reid, a professor at the University of Oklahoma, to make the study that we needed. This was trying to get from pollution loading to dissolved oxygen in each of the water resources regions. There's a formula called the Streeter-Phelps formula which is used to do that for a particular project. If you put the effluent from a sewage plant into a river, immediately the BOD [biochemical oxygen demand] in the sewage uses up oxygen in the river. The Streeter-Phelps formula is the one that tells you how the river recovers as the pollution is assimilated in the flowing water.

George Reid was paid by the Public Health Service to help us with this, with the understanding that the work would not be attributed to them. George Reid was another of those people who were fearless in the face of bureaucracy, as was Nathaniel Wollman.

What I started to say about Nathaniel Wollman is that when the bureaucracy knocked him down and told him he couldn't do what he wanted to do, the next day he would come up with a way to get around their objections. This would go on, week after week, and he used a trial and error method because we were having to take a lot of short cuts to do what we wanted to do. He reminded me of a toy that we had. At that particular time, I had two daughters who were babies. Or I should say one of them was a baby and the older one was three years old. And they had a toy which was a roly-poly kind of a little figure of a man, and no matter what you did, when you knocked him down, he came back up. That was the visualization I had of Nat Wollman, because no matter how many obstacles they put in his way, he would come back up.

Q: Well, he must have impressed you because you later used him on the National Water Commission too, after that.

A: No, you are thinking of Abel Wolman.

Q: Didn't Nat Wollman, though, write one of these studies for the National Water Commission too? I'll try to check. I had the idea he had.

A: I tried to get him, but he couldn't do it. By that time, he was dean at the University of New Mexico, and he didn't have time to work for the National Water Commission as I recall it. But he had refined his study on water supply and demand, which was published with a co-author named [Gilbert] Bonem. They found all kinds of mistakes that had been made in the short cuts that we had taken, including a gross mistake that was made on the water supply side, not so much in the water supply, but in the storage calculations.

Getting back to the Select Committee, all of the studies were in draft form, and most were finished and published by the summer of 1960. To wrap up what I considered to be the first phase, I wrote a draft of a staff report to the committee. I wrote that to kind of summarize these studies. But it covered the water supply/demand study even though it was still in the very preliminary draft stage. I sent a copy to Abel Wolman, and he sent it back with many suggested changes. He really panned it and raised a lot of questions.

So I fixed it up as best as I could and gave a copy to Senator Kerr and told him that it was the first draft of the summary of phase one of the study and that I'd like to get the committee to approve so we would go on to phase two. Phase

two was to include studies of things like interagency relationships, economic analysis, cost sharing, and agency responsibilities. This was really to be the analytical part of the committee's work, which Ed Ackerman and I had looked on as being the important part of the study. The background in phase one was just to provide the data so you can do the analysis.

Senator Kerr had a fast airplane, I think it was a converted B-26 or some other war surplus plane, that he used to travel back and forth from Washington to Oklahoma on weekends. I guess it was the Kerr-McGee Company's plane. Anyway, he took a copy of the draft of the staff report so he could read it on the way down there. When he came back on Monday, I asked him what he thought of the report. I almost fell out of the chair when he responded that he felt that with a little editing it really did the job that needed to be done to complete the committee's work.

I think I realized that if we had gone into phase two, we would have needed a lot more time and money, and that it would be very controversial.

Q: That report actually is fairly succinct and quite short, considering all the work and background studies that had gone into it.

A: Yes, that's true and at that time it didn't have any recommendations.

Q: It comes down to about 100 pages.

A: Let me say that the report that Senator Kerr liked so much was only about half that long. The front part or summary was just 10 or 12 pages, and the description of the studies was about 50 pages.

Q: How did you get into the recommendations?

A: At that time, I hadn't even thought about the recommendations. We didn't have any recommendations in it, except maybe some recommendations for further studies. The water supply/demand study was not yet completed, so I felt it was premature to formulate recommendations.

Q: Right.

A: The draft report was really was what we called the substantiating material in the final report. And that was basically what it was. Of course, we did an awful lot of refinement of that first draft, with the help of Ed Ackerman, Abel Wolman, and Gilbert White. We worked on it for the rest of the fall because Senator Kerr wanted to get it finished by January. You remember, this was an election year, a presidential election year, the year that the Kennedy-Johnson ticket was elected. Kerr was supporting them all the way down, and it took a lot of courage on Kerr's part, because of Oklahoma's being a Southern Baptist state and it was felt that they just didn't quite trust Catholic Yankees from New England. But Kerr came out very strong for the ticket in Oklahoma and everywhere in the South.

Q: Can I interject something at this point?

A: Sure.

Q: The recommendations that are in this report include recommendations for more scientific research, for biennial assessments of water supply/demand relationships, even something about nonstructural management of water resources.

The question in my mind is-and I'm looking at it with the benefit of 20/20 hindsight and particularly some of the things that Clinton Anderson is later involved with-was there at that time a feeling among the senators who were involved that some of this activity would more appropriately be done at the state level rather than at the federal level? Was this a call for greater state/federal cooperation? Was that-1 don't want to use the term "hidden agenda"-something that was implicit in much of what was being said there?

You know, later on, of course, in '63 you had the Water Resources Research Act that gives money to the states for a lot of scientific research at the land grant universities. Was there any feeling about that? Was there any active involvement on the part of some organization like the ICWP [Interstate Council on Water Policy] or anything like that?

A: All of that came later. Let me just finish telling how we got the report finished. We did get it finished in January 1961, well within our budget. As a matter of fact, we didn't even spend all the money we had because we got some hundreds of thousands of dollars of free work from the federal agency people.

After Kerr had made the decision that the staff report would become the committee report, the consultants were brought in, Ed Ackerman, Abel Wolman, and Gilbert White, and we evolved some rather basic recommendations that we all could agree on. We had quite a number of recommendations in the first draft. Generally they were all of the nature that you just mentioned, for more scientific research and so forth. But they were all for accomplishment by the federal government in cooperation with the states.

But some of the members of the committee, Clair Engle, Phil Hart, Gale McGee, and Ted Moss, were not happy. You can see their supplemental views in the back of the committee report. They just didn't think that this report achieved what they had hoped to achieve. So when the committee met to review and approve the report, they wanted to change it.

Senator Kerr had a way of handling that. He said, "If you don't like this report, we will be glad to consider any changes that you want to make." And his technique for doing that was to read the report page by page. And so he started reading the report at page 1.

In a few minutes, they all folded. They had been pushed by staff people who wanted to use this report to beat the administration, the Eisenhower administration, over the head on water; I'm pretty sure that was the reason they wanted changes made. But when they sat there in a committee meeting, it was up to them, and they didn't really care. Anyway, they did write, or their staff wrote, supplemental views, which the committee had voted to permit them to include at the end of the report. And the primary thrust is for things that would have been considered if we had gone on with phase two of the study, as originally contemplated.

One thing in Senate Resolution 48 that was very hard for me to come to grips with is the part of the resolution that called for the committee to make studies of the extent to which water resources activities in the United States are related to the national interest. This goes to the point you raised a few minutes ago-what should the states do, and what should the federal government do--but it's even a broader question. Is it in the national interest that we provide flood control for everybody, that we provide all the water to everybody that they want, at cost?

Anyway, this was what Senator McGee, in particular, was driving at, but I think they were really trying to use it, you might say, to beat the Eisenhower administration over the head for not recognizing the national interest and for vetoing all these bills. And I think that was the original concept that led Mansfield, perhaps unknowingly, to introduce the resolution.

Q: Let me go back now to a question I wanted to ask earlier, and we got on to something else, because it seems to me this does require some clarification. You started off the discussion by suggesting that this resolution, Senate Resolution 48, was, to a large extent, a response to A-47 and the Bureau of the Budget—

A: No, I was talking about Senate Resolution 281 and Senate Resolution 148 of earlier Congresses being responses to A-47. I said that Senate Resolution 48 of the 86th Congress was a response to the Eisenhower vetoes of a number of water resources bills—

Q: Okay.

A: -the veto of the Army authorization bill, the water quality bill, the Reclamation small projects bill, and the public works appropriations. They had to cut the appropriations bill down to pass and also reduce the scope of the water pollution control bill.

Q: Would it be fair to say that there had been growing congressional disenchantment with administration policy for the eight years of the Eisenhower administration; that the vetoes culminate, in a sense, that dissatisfaction, and that, therefore, you have this Senate Resolution.

A: You've said it much better than I. That's the thing: growing disenchantment and the vetoes were the last straw, and an election coming up there and—

Q: I wanted to pursue this area a little bit further about the relationship between the federal government and the states, and what concern, if any, the Kerr Committee had about that relationship, whether in fact the committee saw some necessity on the part of the states to assume a greater burden in the research and planning and even constructing of water projects.

A: Certainly Ed Ackerman had that feeling. Remember he had served with President Truman's Water Policy Commission, which recommended decentralizing planning into river basin commissions, and also with the Budget Bureau trying to reduce the federal role to hold down the budget. So, Ed Ackerman had that at the back of his mind when he laid out the first draft of a program. This was before I was involved. We used Ed as a consultant and we talked about the role of the states. He used to say that he felt there was a resurgence in the states' ability to deal with their own water resources problems. At about the same time, you remember, there was the Kestenbaum Commission which made a report out of which grew the Advisory Committee on Inter-Governmental Relationships, and that was a current document at that time.

So Ed really felt strongly that there was a resurgence in the states. One of the things we did at the outset of the Senate Select Committee was to write to all states and ask them for their views as to what were their water resource problems, what should be done about them, and what was the relationship of water resources to the national interest. We printed the responses as Committee Print Number 6. It was a big, thick document with all these reports, but it was very, very unsatisfactory. It showed that some states, like California, were probably way ahead of the federal government. Really, the Central Valley project of California and the whole panoply of works out there was all laid out in a state of California report written about 1930, and the Bureau of Reclamation only came in when the state couldn't raise the money. A few of the other states were also well advanced in water resources.

But when we went to a state like New York with a letter to the governor, and we got an answer from the State Department of Agriculture saying that, "The real problem we have in New York with water is providing water for agriculture," some of us felt that they didn't have the ability to focus on the major problems. It seems obvious to us that the New York City water supply and the pollution of the Hudson River, which was what kept New York from using the Hudson River, were more important problems. Even at that time, the groundwater in Long Island was known to not be inexhaustible. So the response we got made us feel that they didn't know what their major problems were going to be in the future.

Then we got a letter from an assistant to the governor of West Virginia, and apparently they didn't have anything going on in the water resources field. I

could name some other states that made us feel-or at least made the senators feel-that we were not yet ready to turn things over to the states yet. So Ed Ackerman's idea was not a major thrust with the committee. Remember, the members were in positions that enabled them to bring federal largess into their states. And Kerr, at least, felt that was his role.

Looking at the recommendations, as you pointed out, there were not a great many recommendations, but the first one was that the federal government, in cooperation with the states, should do comprehensive river basic planning in all the major river basins. That came about because of Senator Kerr's interest in the Arkansas-White-Red basin study. He felt that was wonderful because it provided lists of all of the potential projects and when his constituents wanted something he could go either to the Bureau of Reclamation or Corps of Engineers and get them to recommend it. And so the river basin planning was to be a state/federal undertaking. The recommendation starts out saying, "The federal government, in cooperation with the states" should prepare the plans. In other words, Kerr's thrust always was with the federal government being responsible.

And to encourage the states to cooperate, the committee's idea was that the federal government would give the states money to stimulate state participation, so that was the next recommendation.

And then, I guess because of the fact that we couldn't really resolve the questions about desalting or weather modification, scientific problems which are still far from resolution, the committee recommended that the federal government should mount a coordinated scientific research program on water.

Water Resources Research Act of 1964

So, the idea that eventually became the Water Resources Research Act of 1964 was not really considered by the committee, even though at the hearing in Detroit, probably in December of 1959, the idea was broached by a Professor [Raleigh] Barlow of Michigan State-the hearing was in Detroit but he was from Michigan State-and he said something very simply, like, "This problem is just as serious and it should be approached in the same way as we approached agriculture almost a hundred years ago in the Morrill Act. We need to establish university programs to find answers to water resources problems,

the same way we did with the land grant colleges in the Morrill Act." I think it was 1862.

So Barlow was really the instigator of this idea which was incorporated into the Water Resources Research Act enacted in 1964. A lot of other people have claimed credit, and later I guess you'd have to give Senator Clint Anderson the credit for getting it enacted. Clint Anderson was a member of the Kerr Committee. He wasn't at the Detroit hearing, but I may have discussed it with Ben Stong, who was Clint Anderson's staff man on the Senate Interior Committee. He pursued the idea with Clint Anderson and lined up support from the land grant colleges. Ben Stong was the person who was assigned by Senator Anderson to help with implementation of the recommendations of the Select Committee. I was back at the Legislative Reference Service by that time and worked closely with Ben Stong. Senator Kerr had died on January1, 1963, which was almost two years after the report was published and before any of the implementing legislation had been enacted. Senator Anderson, picked this up as chairman of the Senate Interior Committee, because the water research program was the responsibility of that committee.

One thing happened which was not remembered very much, but you remember I mentioned how closely the Geological Survey had worked for the Senate committee. They set up a whole section under Roy Oltman, and we had five or six people there working as hydrologists, providing the data which went into the Nathaniel Wollman study, as well as coordinating with all the other federal agencies.

The first thing that happened after the Select Committee report was issued was that President Kennedy, who had just recently taken office, sent a message to the Congress which more or less embraced the report with both arms. I sometimes wondered if he really loved it so much or whether he was trying to get Bob Kerr on his team because of some votes that were coming up. Anyway, President Kennedy's message to Congress outlined what he was going to do. Among other things, he asked the National Academy of Sciences to do a study of water research, and he ordered the federal agencies to look into the planning side. That's what really got things going.

At the Geological Survey, the Water Resources Division was headed by Luna Leopold at that time, and he proposed the establishment of a Water Resources Research Institute to make the research study that the committee recommended.

The survey sold the idea to the Bureau of the Budget, and in the budget that went up to Congress in January 1962—this would have been the budget for fiscal year 1963—there was a recommendation for establishment of a Water Resources Research Institute as a part of the U.S. Geological Survey Water Resources program. This was in the budget, and the Geological Survey has always taken the position that they didn't really need any more new legislation on research because they've got a broad, organic act which authorizes them to do almost anything in the water resources and natural resources area pertaining to research. And so the Water Resources Research Institute was put in as a line item in the 1963 budget. I don't remember the amount. It came up to the Congress and was favorably considered by the House Subcommittee on Interior Appropriations. This was in the spring of 1962.

I don't know exactly what happened after the subcommittee reported the item favorably, but it was not included in the appropriations bill when the appropriations bill passed the House. I was told that staff of the House Interior and Insular Affairs Committee had felt that this item needed legislation. I don't have any documentation of that, but I believe at that time Eugene Eaton was on the staff of the House Interior Committee and he was always very critical of the Geological Survey.

One way that the states got into this is that Ben Stong asked me to draft letters to all of the states and ask for their views about how we ought to approach water resources problems. Senator Anderson eventually published all of the responses in a committee print and out of that grew the draft of the Water Resources Act.

I don't know whether Ben Stong drafted the bill or whether he got the Interior Department or the Legislative Council to draft it, but it was introduced and eventually became law. It first passed in the Senate, but Wayne Aspinall was chairman of the House Interior Committee and he was not in favor of setting up new federal programs. It took a lot of persuading, which was done largely through Ben Stong , working with the president of Colorado State University, who helped to convince Wayne Aspinall that this would be a great thing.

Originally, in talking to Ben Stong, we had agreed that there should be not 50 research institutes but a series of regional research institutes to lessen redundancy. That idea was soon rejected because it was pretty obvious that

politically you more or less had to have something to get enough votes, something in every state.

In the meantime, it was still the Public Health Service that had the Water Pollution Control program. They moved right in and they set up a number of research laboratories, including the Robert S. Kerr Laboratory in Ada, Oklahoma. They set up a laboratory in the Great Lakes, and they took the regional approach, and they had these several laboratories and really were much closer to the idea that the Kerr Committee had than was the Water Resources Research Act. But, politics being what it is, the Water Research Act had the benefit of something for every state, and that's why it got through. Clint Anderson didn't have anything to do with the water pollution control labs because they were handled by another committee in the Senate, but they were certainly an outgrowth of the Kerr Committee. They may have even been entitled before the Kerr Committee report was completed because this was something that we talked about a lot when we were working with Mel Scheidt trying to get the Public Health Service to help us during the process of preparing the program report.

The other outcome of the Kerr Committee report-I'm talking now about the major recommendations-was for the river basin planning and the support for the states. My first efforts on that line, which were for Senator Kerr, were to draft a bill. For this I had to consult with the Legislative Council, which had to draft all bills.

They insisted on a rather arcane formula for dividing up federal grants among states. It was the same formula that had been used earlier for dividing up the money for the water pollution control grants. You should remember that the early water pollution control effort was grants for planning, coming out of the 1948 and the 195 1 or '52 Water Pollution Control Acts. The formula was a rather difficult thing to understand, the way part of the money was going to be divided up according to population and part of it divided in accordance to problems, and this was so complicated that the first bill didn't get very far.

I'm not sure whether it was ever introduced, but later a bill was sent up by the Interior Department which eventually became the Water Resources Planning Act. This went far beyond what Senator Kerr had envisioned because it started off with establishing the Water Resources Council, and Senator Kerr was not

at all interested in the Water Resources Council. He was interested in comprehensive plans.

He had no problem with the river basin commission idea, but the report had said, "the federal government in cooperation with the states," was to do the planning. he had been thinking in terms of the AWR [Arkansas-White-Red] approach, which was essentially a river basin commission although the authority for it was in the Army Corps of Engineers. So Senator Kerr would have taken a position against the idea of a water resources council because he liked the system the way it was. He was getting what he wanted for the state of Oklahoma and didn't want to complicate the system.

The bill went through several drafts over the next several years and finally became the Water Resources Planning Act of 1965. I have documented all this in a report called "The History of the Implementation of the Recommendations of the Senate Select Committee," and I'm hesitant to go into any more detail because it's all laid out in that committee print.

Q: Well, let me ask you some conceptual questions. Maybe that might help us focus on what you're talking about. Again, I don't mean to sound like a broken record. However, there has been some dispute among people-historians and others-about what was the intent in setting up something like a water resources council.

Some people argue it was an attempt to decentralize the administration and the power, really, in relationship to water resources development in this country, so that you would have more input from nonfederal interests, not just states but regional authorities and people like that. Others would argue that there really was no reallocation of power or anything like that, that it was purely an administrative convenience, almost, rather than anything else.

How do you see this?

A: Well, that brings up something else that was happening about the same time. You remember we had the FIARBC, sometimes called the FIREBRICK, and eventually the ICWR, sometimes called the ICEWATER, that had a Subcommittee on Benefits and Costs, which produced the Green Book on economic analysis of water projects. So it was probably as a result of the Senate committee recommending that the federal government should prepare

and keep up-to-date the river basin plans, that the Inter-Agency Committee on Water Resources [ICWR], issued a set of standards and procedures which was sent up to Congress and published as Senate Document 97, setting forth the procedures for doing the planning and analysis. And so I guess you might say that was a response to the Senate committee's recommendation, but not in exactly the way that the Senate committee had in mind. But it did come up and it provided a kind of a framework.

But it certainly couldn't be taken as a shifting of power to the states; at least, I never took it that way. It attempted to standardize the federal approach, it went into the interest rates and the economic analysis and so forth, and it went into the environmental side, the fish and wildlife, and the recreation. But it wasn't anything that Senator Kerr had envisaged. It may well be that Senator Anderson had some kind of hidden agenda on turning power over to the states, but he never divulged it to me. I don't think Senate Document 97 ever became congressional policy. It was really just a statement of the policies the administration was going to use in project analysis. I'd have to read what the President said when he sent it up, but I don't think it ever had as much standing as Budget Circular A-47, which I believe it replaced.

Q: Well it makes a strong pitch, of course, for multipurpose planning.

A: Yes, that's true but multipurpose planning has been an idea that's been in existence ever since back in the conservation movement when it was espoused by the National Conservation Commission and the Inland Waterways Commission. I'm not sure that anybody ever really understood what it meant back in 1910. But as the ICWR studies evolved into Senate Document 97, they eventually provided a kind of a foundation for moving ahead with the principles and standards promulgated by the Water Resources Council.

I'm probably wandering away from the thrust of your question, but I didn't sense at that time any real consensus that the Congress wanted to move power back into the states. And I think any thrust of that nature in the administration was largely as a result of the Bureau of the Budget's wanting to reduce the federal budget. But they were approaching it more through cost sharing than through putting responsibility on the states.

Water Resources Council

When the bill to create the Water Resources Council and the river basin commissions-the Water Resources Planning Act-when that first was introduced, the states were pretty much dead against it for quite a while until languages evolved that essentially gave the states one vote and the federal government one vote, which made the states feel equal. But I always looked on the river basin commission as a team consisting of one horse and one rider, the federal government being the horse and the states being the rider.

I think there may have been some commitment made to the states in order to get the Interstate Conference on Water Problems to support the bill. At first, the states wanted to have a representative on the Water Resources Council, but the Justice Department and other federal people opposed it, arguing that it would be unconstitutional to have a federal agency with an officer appointed by states and not a federal employee. But I think as a kind of a sop to the states, they agreed that one of the principal officials of the Water Resources Council would be from the states, and the states did see that Harold Wilm from New York was appointed as an assistant director. I guess he was supposed to be the state representative in the administration of the council, but he was not a member.

One of the big mistakes when the staff was set up was the agreement that there be on the staff one person from Interior and one from the Corps of Engineers and one from the Agriculture Department, just to kind of, you might say, protect the interests of the various departments. In a way, it kind of emasculated the council; kept it from really doing any staff work that adversely affected any of the agencies. And there's a provision in that act that said nothing in this law setting up this council shall have any effect on the activities or authorities of existing federal agencies. So, the council was kind of emasculated before it was created.

Department of Natural Resources

Q: Well, if you don't mind, let me go back a bit and I want to trace a couple of things here.First of all, Henry Caulfield, when I interviewed him, suggested that in 1961, soon after Kennedy became President, a small group of people within the Department of the Interior agreed for the creation of a Department

of Natural Resources, obviously with one intent being to assimilate the civil functions of the Corps of Engineers into this department.

But the White House staff basically said, "No, we don't want to do it that way." The White House, according to Caulfield, was under the influence of Richard Neustadt, a Harvard political scientist who argued that the separation of functional areas can work to the advantage of the President. The argument was that you don't want to have big departments with so much power that they can actually undermine the power of the President.

And so the Department of the Interior people fell back on the idea of having the Water Resources Council bring all of the agencies together. In other words, Caulfield argued that the idea for the council came up in the Department of the Interior. Whether it came up before or independently or whether Clinton Anderson or other people in the Congress were involved I don't know. I don't think Caulfield answered that question. Do you have any knowledge of any of this sort of stuff?

A: What I can verify is that there was a group of people in the Interior Department promoting the idea that there should be a natural resources department when I was working there in the 1940s. At the time of the first Hoover Commission, we did a lot of work on material that was sent over to the task force on water and power or whatever they called it at the first Hoover Commission on this subject. As I recall, it was about the same time that I worked with Arthur Maass on the Pine Flat Dam history. I think the idea of having a Department of Natural Resources was also under consideration in the early years of the Eisenhower administration. The member of the Senate Select Committee who favored having a Department of Natural Resources was Senator Frank Moss of Utah. It never came up in the committee, but he later introduced legislation several times.

But I was not privy to the arguments within the administration about the proposal to create the Water Resources Council. When the proposed legislation came up from downtown, I thought it might lead to something that might evolve into an independent agency like the Federal Power Commission. You remember, the original Federal Power Commission created in 1920 was not an independent agency. It consisted of the Secretary of War, the Secretary of the Interior, and the Secretary of Agriculture. It was set up in 1920 with a staff that was supposed to do comprehensive planning to provide a background for

licensing hydroelectric power development. I don't know the details of how it evolved into an independent agency, but I think it started when it tried to do comprehensive planning on its own. The Corps of Engineers saw this as a threat to its water resources authority and started the actions which eventually led to the Corps' being authorized to make the 308 reports. It was not my idea, or the Select Committee's recommendation to set up the Water Resources Council, but I had the hope that once it was set up, it might evolve into an independent agency, and we would have a group with some power to do rational comprehensive planning with the states.

That was an idea of mine, but I can't remember whether I've ever articulated it in a published article. I may have said it in a speech or answered a question, but anyway, that was the idea in the back of my head. It would have been something like a Department of Water Resources which might well have expanded into a Department of Natural Resources if Henry had said there was a group at Interior that had something like that in mind. I'm sure there was, because he was there, but I think they were primarily interested in aggrandizing the Interior Department by bringing in the water resources programs of the Corps. I don't know exactly what was Henry's role in the department, either in the Truman administration or when he came back in the Kennedy administration with Stewart Udall. He was one of these people in the department that always came to meetings, but you never did know really what they did except that when they stopped you from doing something, they could pretty well do it because they had the ear of the secretary.

Q: Let me ask you another question along the same lines. The relationship between Senate Document 97 and the Water Resources Council, now, it may be that there's no real relationship, but if I as an historian look at the Water Resources Council some time after 1965 and I also look at some of the guidance offered in Senate Document 97, I can easily jump to the conclusion that there was a relationship. In particular I have in mind that Senate Document 97 talks about regional planning, river basin planning basically. It talks about multipurpose planning in the sense of treating hydroelectric power generation and recreation facilities and fish and wildlife conservation as subjects that have to be responded to and integrated in any kind of water project plans.

So, you know, the Water Resources Council, with its strong emphasis on river basin planning, would seem to be a natural outgrowth of that kind of approach. Am I wrong?

A: No. There's a direct relationship. But it didn't spring full-blown in Senate Document 97. It came out of the Green Book, for example, and all the other work of the Federal Inter-Agency River Basin Committee. You remember that FIARBC set up a Missouri basin inter-agency committee, and one in the Columbia basin. Then, of course, the Arkansas-White-Red and the New York-New England and the Southeast River basin committees or commissions, set up legislatively, were all part of the evolving consensus on river basin planning. So I don't really see that there's any great difficulty in getting from the work of the FIARBC down through the ICWR to Senate Document 97 and the Water Resources Council.

The impetus for Senate Document 97 was to let the Congress know how it was going to be done. I think the President demanded that they send it up to show how they were responding to the Senate committee. And the same people were involved: Henry Caulfield from Interior, Reuben Johnson from the Army Corps of Engineers, and Harry Steele from Agriculture. They were all involved with the Inter-Agency Committee on Water Resources and its task forces or subcommittees, and they were the top staff people in the Water Resources Council. Of course, there were many others involved over the years.

So you basically had the same people doing essentially the same thing, but within a different organizational framework. But in the Water Resources Council they had a mandate to have principles and standards and procedures, which gave them a much more sturdy peg to hang their hat on because all of the FIARBC was voluntary, and even the ICWR, while the President had set it up, had no enforcement powers. No department had ever formally adopted the Green Book. In other words, they all agreed to publish it, but they never said, "We will follow the Green Book." They said, "We will follow the Green Book as long as it doesn't interfere with our statutory responsibilities."

Q: Well, there again is one of the reasons why it would seem, going back to Senate Document 97, that while you can trace the evolution of that document back to the Green Book and some other early inter-agency reports, it would seem like there had to be a catalyst. Obviously a Democratic administration coming in was important, but it had to be responding to something. Otherwise, you know, it wouldn't have received that presidential imprimatur and become executive branch policy. It was not executive branch policy until 1962, even though you can see the evolution, so something happened, whether it be the Kerr Committee report, whether it just be just general dissatisfaction with the

way things had been treated or whatever, to convince Kennedy that that document was necessary at that particular time, and I guess—

A: Well, I wasn't in a position to know why he sent it up at that time. Remember, I was in the legislative branch then, back at the Library of Congress. But I feel sure that Senate Document 97 was presented to Kennedy for his signature-and I haven't looked at this document for probably a decade or more-in response to his decision to implement the Kerr Committee report. I think the real reason was that he needed Kerr's vote on other things, and he saw promoting the Kerr report as one way to butter him up.

Q: Don't forget, he also, shortly after he became President, sent a special message to Congress—

A: Yes, that's what I referred to a few minutes ago, and in that message he told them to do what was needed. That was the basis for the Geological Survey's attempting to have a Water Resources Research Institute. But whether this group within the Interior Department that was pushing for a Department of Natural Resources was using the message, hoping to take over the whole water resources area had anything to do with the President's message, I don't know. I was not in a position to know how it came about, and so I can't trace the history of it the way Henry Caulfield probably would. But Henry was in the Interior Department; he would see things as a part of Interior policy whereas if you went to Gene Weber, he would probably have seen things differently from the viewpoint of the Corps. I don't really know who in Agriculture was involved in this.

Agriculture was more or less left in a shambles, as far as water policy was concerned, after Secretary Benson disbanded the Office of Land Utilization. The way it looked to me, there was no real overall coordination in the department, so I don't know what they were doing in the beginning of the Kennedy administration. I can't even remember who was the Secretary of Agriculture then. There was an assistant secretary who served on the ICWR, but I can't remember his name either.

So, I don't think I can help you in getting the rationale for Kennedy's actions.

Q: Well, let's go back to you and what you were doing specifically. How long were you actually working for Senator Kerr then?

A: Really, just for about 20 months, from May 1959 through January 1961, and then I went back to the Library of Congress. Of course, there were all kinds of things waiting for me to do. I was still the senior specialist in the engineering and public works field, and I had a lot of other responsibilities in the public works area, but most of my work was in water resources. I did a lot of work with the House Interior Committee. One of the first reports I did when I started work in the Legislative Reference Service was on the accomplishments of the reclamation program. It was published as a committee print. Later I did another study highlighting the problems of the reclamation program. They decided not to publish it because it unmasked the idea that this program was reimbursable by just laying out the economic facts that showed that some projects were paying back 2 percent and some projects were paying back 15 or 20 percent, but the average was somewhat less than 15 percent, probably even less than 10 percent of the total economic cost.

I guess Wayne Aspinall, God rest his soul, didn't think that would be helpful for what he wanted to get done in Colorado and what the committee wanted to get done in the West, so that report was never published. But I still worked with the committee quite a bit on specific projects, but if you asked me, "What did you do, what did you contribute between 1961 and 1968—"

Public Works and Water Resources, Library of Congress

Q: That was my next question.

A: -it's hard to really put my finger on things. But just to get some levity into this discussion, which has been so serious for the last few minutes, I remember I used to lecture to the planning associates or whatever they called them at the Corps of Engineers and also the district planning officers. One time they asked me to go down to Dallas to talk to the group. Of course, they said they would pay my way and make the reservations. But the Library demanded that the Corps not pay for my ticket but that I buy my ticket and that the Corps would reimburse the Library which would reimburse me. So the Corps made the reservations for us all to fly on American Airlines to Dallas. I think it was American Airlines because I remember it was what they called a champagne flight on a Lockheed Electra and we sat up in the front there, four of us at a table drinking champagne with our lunch because the Corps had made reservations to travel first class.

When I put in my travel voucher to the Library, with the appropriate papers for them to get reimbursement from the Corps, they wouldn't reimburse me. They said, "You don't have authority to travel first class, so we can't reimburse you for any more than the coach fare." Of course, I responded, "But I didn't make the reservations. The Corps of Engineers made the reservations and I just bought the ticket. They made the reservations, and they're going to reimburse you, so why don't you just pay me and they'll give you the money and it won't make any difference." And the reply I got was, "No, positively only the librarian can travel first class-not even the deputy librarian can travel first class-and you have to have authorization."

And so I called up whoever I had been working with in the Corps of Engineers, and I said, "How do you guys get to travel first class?" And they said, "Oh, it was simple. We just wrote that we were traveling with a high official of the Library of Congress that justified first class travel."

So then I wrote a memo back to the Library's accounting office saying that this trip was arranged for me to travel with high officials of the Corps of Engineers and it was deemed appropriate that we travel first class, and so they paid me.

This was just indicative of the kind of bureaucratic approach that the Library of Congress had. Everything had to be in accordance with the rules.

Q: Well, let me ask you about some specific projects. If they register in your mind, let me know; if not, we can just pass right over them; but there were some very, very controversial projects being developed or considered during this time, and I'm wondering whether you had any chance to provide some input. The Rampart Dam in Alaska. Were you ever asked by a congressional committee to do any kind of study or report on that?

A: No, I never got involved in Rampart. Let me mention one other thing that was happening during the rniddle years of the '60s: the enlargement of the federal responsibilities in water pollution control. There were several very important acts, under which the program moved up from the $50 and $100 million-a-year program, which had been first vetoed by Eisenhower and passed over his veto, into the billion dollar class. They kept the responsibility in the states, but each state had to get a plan approved and standards approved to get the federal money.

It was really peculiar but I never got involved in that program. As far as I can remember, the Legislative Reference Service was never asked to do any work in that field, which became one of the biggest water resource programs of the federal government. On the House side the committee that was handling that program didn't seek any help in that field of its activity, and on the Senate side it was largely Senator Muskie who carried the ball on water pollution control. I was never called on to help that subcommittee, although I worked quite a bit with the staff of the Public Works Committee on other programs. Water pollution control legislation was handled in a different subcommittee.

Incidentally, talking about Senator Muskie, I mentioned that the Senate Select Committee had held hearings only in the states where the members were from, except for Massachusetts and Maine. Senator Muskie asked that a hearing be held in Maine, and we had that hearing in Augusta on a cold, wintry, blizzardy day in Augusta. All of the state officials came before the committee and said, "We don't really have any water problems here. Everything is fine," but the environmental interests came and complained about the polluted rivers and other environmental hazards.

We had briefed Senator Kerr and given him questions to ask about East Coast salmon-there used to be quite a salmon run in the East Coast-and the clam beds and other water pollution related problems that were not being taken care of. When he asked about the environmental interests, they told him there was no salmon because the paper mill wastes had pretty well wiped out all of the biota in the streams.

When Senator Kerr was asking the state officials about these problems, they squirmed and gave some rather weak responses, so he continued with some rather pointed questions. It was like a cross examination, and Kerr was good at it, and he started boring in on state officials, cabinet officials in the state government. He was asking the questions that I'm sure Senator Muskie knew and could have asked but thought it was better not to be too rough on his home-state constituents, and so he let the out-of-state senator ask them. In a sense Kerr was more or less beating the state officials over the head and embarrassing them because they were not giving him the same answers that he had been getting from the environmental spokesmen.

The local people in the back were clapping while Senator Kerr was giving their officials a bad time, and Senator Muskie seemed to be enjoying it. I had the

feeling that this was a kind of epiphany for Senator Muskie and made him realize that coming on strong for the environment was good politics. Later on, he made pollution control a major thrust in his campaign for the presidency in 1972. Unfortunately he was knocked out in the primaries, but he continued his career in the Senate as "Mr. Clean." I always felt that the Augusta hearing of the Select Committee is where he really got the message about the political importance of being for pollution control by watching the way Senator Kerr handled the water pollution issue there and seeing how it was so popular with the people in that hearing room.

Another interesting thing at that time which is completely irrelevant and I probably shouldn't mention. The request to have a hearing in Massachusetts was from Senator Jack Kennedy. There was a blizzard or a bad storm, so we had to drive from Augusta down to Boston and at 70 miles an hour in a snowstorm because there was a reception for us that night before the hearing the next day. When we got to the Massachusetts line, there was a phalanx of policemen on motorcycles and squad cars with sirens blaring to speed us along. I remember it well because Senator Kerr and Senator Muskie were riding in a big Cadillac limousine and I was riding in a Rambler, driven by somebody I didn't even know. They were driving at 70 and 75 miles an hour with this police escort, and we were trying to keep up on snowy roads and hoping we would get there in one piece.

We finally got there, to the Copley Plaza Hotel and they had laid out a reception and a spread for us which could not be equaled, followed by a sumptuous banquet. The next day we had the hearing in the Federal Courtroom, with Speaker John McCormick sitting up there with us; Senator Kennedy wasn't there. And they brought in a very fancy luncheon, which we had to take turns eating because we didn't plan to have a luncheon break. Because of my conservative nature, I kind of protested and told them we were not used to being treated like that.

But I was told that having this hearing was very important to Jack Kennedy and that he had asked that we be given the best of everything. So I thanked them profusely, saying that we appreciated it very much, and I said something like, "This must be costing you guys a fortune." And again I was told that Kennedy had asked for us to be given a royal treatment.

You remember, this was at the time of the beginning of the 1960 campaign. It was December 1959, and Jack Kennedy was already a candidate and so was Lyndon Johnson. And I don't remember just when it was, probably several months after the hearing, Bob Kerr announced that he was supporting Lyndon Johnson.

About a week later we got a bill from the people in Massachusetts for $1,500 or $1,800 for the banquet and the reception and the luncheon, and maybe even for the police escort. I'll always feel that they didn't send that bill as long as they thought maybe Senator Kerr might be on their side.

Q: Amazing.

A: Well, I had a lot of interesting times with that committee.

Recreation Act

Q: Ted, there were several acts passed in the mid-1960s of rather important significance to the environmental community and others. One act, for instance, was the Recreation Act in which Congress mandated that the value of recreation could be used in calculating the cost-benefit ratio to justify projects. Did you get involved in that legislation? Then there was another act, establishing the Land and Water Conservation Fund, in which Congress specified that funds collected from park fees and so forth could be used to purchase more park lands; there are some other aspects to that legislation. Were you involved in that?

A: As to recreation, the agencies had used that all along. The Corps of Engineers had a law, going back as far as 1930, which said that recreational boating shall be considered as coming within the definition of commerce and as commercial navigation.

Then the 1944 Flood Control Act authorized the Corps of Engineers to include provisions for recreation in reservoir projects. That law, in my opinion, makes recreation a federal purpose just like flood control or navigation.

Q: But the '44 act authorized the Corps to build recreation facilities. It did not specify that recreation should be calculated towards the cost-benefit ratio to justify a project.

A: Well, remember, the defining statement that Congress made about benefits in the [1936] Flood Control Act was that if the benefits to whomsoever they may accrue shall exceed the costs, then federal participation was warranted.

But the Congress never specified how you calculate the benefits. That left the door open, and so the Corps could use recreation benefits. If that had been an authorization for the Bureau of Reclamation and Michael Straus had been the commissioner, they would have picked up the ball and run with it. As it was, they had nonreimbursable allocations to recreation in some of those reclamation projects. This was one of the things that Budget Circular A-47 tried to put a stop to by requiring a local contribution of half the cost of whatever the benefit was.

Land/Water Conservation Fund Act

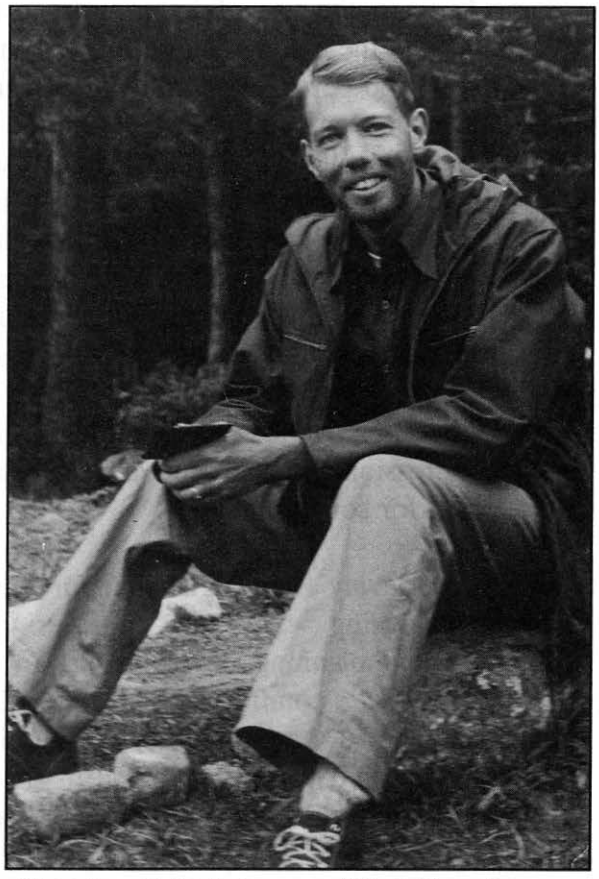
I may have commented on the recreation legislation to the staff of the House Interior Committee, but I didn't do any major study on it. And the Land and Water Conservation Fund Act more or less stemmed from the work of the Recreational Resources Review Commission, which broached that idea. The Interior Department picked up the idea from the commission report and sent up the proposed legislation. But no, I wasn't consulted on that.

Q: How about the Wild and Scenic Rivers Act? That was passed in '68, I believe.

A: Yes. Incidentally, one time somebody wanted to give me an award for being the father of the Wild and Scenic Rivers Act because there is somewhere in the Senate committee report some kind of a favorable comment about this concept, suggesting we ought to consider the importance of preserving some of these rivers in their natural state. I couldn't accept an award for that because the idea came from the National Park Service in the report that they wrote for the Senate committee. The report was prepared by Ben Thompson, a staff member of the Park Service. I think he originated the idea. And so when somebody called me about that many years later, I referred them to Ben Thompson.

But I was sympathetic to the idea of preserving natural streams because I had been involved in promoting the Wilderness Act when Howard Zahniser was the executive director of the Wilderness Society. I've been a member of the Wilderness Society for a long time starting when I was in Seattle. And also, at one point, I was on the Secretary of the Interior's advisory committee on conservation as a representative of the Seattle Mountaineers. I became a member of the Seattle Mountaineers when I lived in Seattle. One of my friends was the president, and since I was living in Washington he asked me if I would represent the Seattle Mountaineers on this group.

This was an informal advisory committee, set up long before the Federal Advisory Committee Act, and what we did would probably be illegal now. It was a group made up of representatives of conservation interest groups like the Outdoor Writers Association and the Izaak Walton League and many others. I developed a friendship with Fairfield Osbourn from the Conservation Foundation, and Howard Zahniser from the Wilderness Society, and a lot of other representatives of the so-called conservation organizations. That was before the term "environmental organization" came into use.



Theodore Schad at camp, Wind River Range, Wyoming. August 1948

So I had been supporting the conservation of the wilderness areas and maintained a liaison with Howard Zahniser when I was down in the Bureau of Rec-lamation, but I didn't have anything to do with the Wilder-ness Act authorization. I was spending my vacations climbing mountains out in the West—the Wind River Range in Wyoming, the Cascades,

the Sierras, and the Colorado mountains, as well as the Selkirks and the Canadian Rockies. I had a personal hope that the mountainous areas could be preserved as wilderness. That's why I was sympathetic when Ben Thompson suggested the importance of preserving wild and scenic rivers in the Park Service report to the Select Committee.

I never did get further involved in the passage of the Wild and Scenic Rivers Act. But among other things, I used to enjoy white water rafting, and it's nice to think that there will be some streams that don't have dams on them and will still have rapids. But it is a fact that some of the best white water boating in this area is below the Corps dam on the Youghiogeny and some of the other rivers where they make releases specifically for that purpose. I suppose this is under the authority of this Recreation Act.

Going back to the use of benefits to justify projects, the Corps, when it recommended the Salem Church project on the Rappahannock River in about 1948, about 60 percent of the benefits were recreation benefits. The project was never built, and I'm not sure what the percentage of the benefits was for recreation, but it was at least half. So in preparing for the Interior Department's comments on that report, which were required under the Flood Control Act of 1944, we took in a holier-than-thou approach, and pointed out that we couldn't really see the great advantage of having that much flat water recreation when you had the whole estuary of the Rappahannock below Fredericksburg and the Chesapeake Bay, and so we questioned those benefits.

I have the feeling that the recreation legislation just put some new parameters, with congressional and executive office sanction, on what the agencies had been doing for some time.

Q: Let me turn away from legislation for a moment and talk a little bit about what's happening within the engineering community in terms of water resources and planning development. In particular, I wanted to get your response to what's coming out of Harvard University. I'm talking, of course, about the Harvard Water Program, of multiobjective analysis as distinct from multipurpose. Did you get involved in any of this activity from the Harvard Water Program. When did you first learn about it and what was your response to it?

A: I didn't get involved with that program at all, and I suppose my first involvement with it was when the book was published. I had several very close friends who were involved in that. Maynard Hufschmidt, with whom I had been associated in the Department of the Interior, was one of the people who had quite a hand in that along with Blair Bower, who is another very good friend of mine. There were some others, members of the Bureau of Reclamation and the Corps' staff who were working on that, and Francis Murphy who was an expert on flood control that I knew from my Corps of Engineers days.

I may have talked to some of them about it earlier, but my first fixed recollection was when Arthur Maass, who was one of my college classmates, came to testify about it before-probably before Senator Anderson's committee on Interior and Insular Affairs. I hadn't even read the book at the time and it's not exactly the kind of report that you would read unless you were having trouble sleeping, but it had some good concepts in it. I knew that just from knowing a little bit about it and having heard what Arthur said about it. So, when Arthur and I were having lunch after the hearing, I suggested that we should try it out on a sample basin. I'm probably exaggerating a little, but my recollection was that Arthur-I don't think he would like it if I called him by the nickname we used to call him at Johns Hopkins, which was Otts—

Q: How do you spell that?

A: I never had to spell it, but I guess it was O-T-T-S.

Q: Why did you call him that?

A: I think it may have been a childhood nickname, but I don't think he liked to remember it. Anyway, he seemed to recoil in horror and said something like, "Ted, no, this is a theoretical analysis. This isn't ready to be applied yet." Of course, my idea was to try to apply it in one basin and see if it worked. That was my recollection of my first introduction to it, and eventually I referred to it a lot and I used it in discussions, but it needed a lot of practical work to be of value. If it had been available to the Select Committee, I would probably picked it up and run with it, and probably stubbed my toe.

But about that time, the Water Resources Council, starting from the base of Senate Document 97, started to prepare the principles and standards. They did

such a voluminous job with their salmon-colored reviews and blue-colored reviews; there were levels of reviews that pyramided one on top of another to an extent that, to be frank, it was hard for me to follow it, and I didn't have time because I had other responsibilities at the Library. At one time I found that I was the only engineer or scientist of any kind in the Legislative Reference Service, so I had to get involved in all kinds of requests for advice in connection with the space program, which was not my primary interest.

Then there was another thing that interrupted my work at the Library of Congress, and I should have mentioned it when we were talking about the origin of the 1964 Water Resources Research Act. A colleague of mine, Ed Wenk, who was executive secretary of the Federal Council for Science and Technology in the early years of the Kennedy administration, was having great trouble dealing with the problem of water resources research. There was a Committee on Water Resources Research with members representing all the agencies which had research programs. The Interior Department was represented by Luna Leopold from the Geological Survey and by Eugene Eaton who had just come into the secretary's office. According to Wenk, those two could not ever agree on what the departmental program was or should be. So every meeting of the Committee on Water Resources Research had erupted into arguments. Why the Secretary of the Interior had two representatives, I don't know, but when it came time for the representative of Interior to chair the committee, it would have been a donnybrook, because the two could never agree on anything.

So Wenk asked me if I would come down and essentially chair or staff a committee of which I couldn't be a member because I was in the legislative branch and it was an executive branch committee. The objective was to get a report to the President on the subject as a part of the response to the Select Committee's recommendation for a coordinated research program, necessary because the Geological Survey's proposal in the FY 1963 budget had been rejected. This was in the fall of 1962. I'll never forget the time because it was at the same time that the Cuban missile crisis erupted. I was working day and night on this project, and my wife said that I was the only person in the United States who didn't know about the Cuban missile crisis.

We were working against a very short deadline, and I was hard pressed to try to bring some sense out of the work of this good committee. There were at least 15 or 20 members, most of whom were easy to get along with and did

their share of the work, but I was not able to defuse this argument between the two representatives of the Department of the Interior. I hate to bring this up because it was such a nasty personal fight, and it kept us in a turmoil. I was down there only for a couple of months, working in Theodore Roosevelt's former house with a bay window on Jackson Place overlooking Lafayette Square.

The way we finally resolved this conflict within the department was that Stuart Udall appointed Roger Revelle as his science advisor, and he became the departmental representative. I had no problem at all working with Roger Revelle. In fact, he was wonderful to work with and was a very staunch supporter of my work. My only problem was that I never could get any work out of him. I had to write all of his stuff because he would promise to write something and wouldn't do it, but he gave me the ideas. I've had that happen to me many other times. But anyway, so I was down there working very hard on that in 1962, and that report on federal water resources research activities was eventually sent up to Senator Anderson's committee. It was published as a committee print.

That was another antecedent of the Water Resources Research Act. There's a provision in the Water Resources Research Act calling for coordination of federal water resources research activities, and Jerry Weisner asked me to stay and chair it for the first year, but I wanted to get back to my work at the Library, so they got Bill Ackermann from Illinois.

Q: One of the reasons why I asked you about the multiobjective system that the Harvard Water Program came up with is because in the water bill that was passed in 1970, the Congress directed the Water Resources Council to develop the principles and standards in accordance with four categories or what were later called "accounts"-national economic development, environmental quality, social well-being, and regional development.

Do you have any knowledge about whether the multiobjective approach that came out of the Harvard Water Program influenced Congress to direct the Water Resources Council to prepare the principles and standards along those lines? I'm trying to see whether there was at any time direct cause and effect, of course, between the theoretical approaches being developed at Harvard and the latter planning guides that come out of the Water Resources Council.

A: I can't really say for sure how that evolved, but I think that the Congress was responding to the studies of the Water Resources Council. Remember, the Water Resources Council was created in 1965 and the staff was appointed early in 1966, so they had been working several years on this, producing what I referred to as the salmon-colored books and the blue-colored books, as they went through several stages of review. I think the reason that the Congress put that provision in the law is that the Bureau of the Budget didn't like the four objectives. They were called "objectives" at first. The Bureau of Budget never really liked anything that the Water Resources Council did as far as I know. And the Bureau of the Budget wouldn't accept anything but the national economic objective. I'm sure that somebody from downtown went up to the committee staff and told them that the Bureau of the Budget was opposing multiobjective planning, and so that provision was put into the 1970 act. I'd have to look at that to see whether it was applied to all agencies or just to the Corps because it was the Corps' authorization.

Q: It was the Corps' act, that's true.

A: But you have jumped ahead of the time when I had an important career change. And again it happened to me in a very embarrassing way. In 1965 I was at an Engineering Foundation Research Conference for a week, at a small college someplace in New England. It was a conference on the subject of solving difficult problems. There were all kinds of people there, including General "Weary" Wilson from the Corps. Whether he was still Chief of Engineers then or whether he had retired, I don't remember. This was a conference patterned after the Gordon Research Conferences, where you have a session in the morning and then you interact in the afternoon among your participants, and then you have a session in the evening. So you really put in a full day, but it's divided into morning and evening, and the afternoon is this informal reaction around a swimming pool or on the golf course.

While I was up there, the director of the Legislative Reference Service, Lester Jayson, called, trying to get me, and he was told that I was out playing golf. He called again the next day, and I was again out playing golf. So when he finally got through to me, he said, "What are you doing up there? I didn't send you up there to play golf. You're supposed to be learning how to solve problems." Well, it kind of put me off my guard, so when he told me that Ed Wenk, who by that time had left the White House staff to serve as chief of our Science Policy Research Division, was wanted at the White House to direct the

National Council on Marine Resources, and that Ed wanted me to head up the division temporarily, while he was gone, I felt that I had to say yes.

So in 1965 I became acting chief of the Science Policy Research Division, while still holding the senior specialist position. The dual role continued two years later when they asked me to be deputy director of the Legislative Reference Service. This gave me much broader responsibilities, so I didn't do as much in the water resources field. But I kept the two offices, and my research assistant, Elizabeth Boswell, so we were able to field some of the important requests, writing papers on congressional interest in water resources and preparing legislative histories of the Water Resources Planning Act and also the Water Resources Research Act and the history of the implementation of the recommendations of the Senate Select Committee.

But that's why I have trouble answering the question "What did you do in the 1960s?"

Legislative Reference Service

Q: So you were doing a lot of supervision as well as your water resources work.

A: Yes, that's right. The deputy director of the Legislative Reference Service at that time really could have been called the director of research. The deputy director was responsible for all of the research output responding to over 100,000 inquiries every year. Most of those were very simple inquiries for information, but many of them were very significant research projects, and those were the ones that I had to kind of supervise.

Q: How many people did you have working for you then?

A: Well, the service had about 300 or 320 researchers and support staff. The director handled the budget and liaison with other divisions of the Library. If he was not there, I had to fill in for him. But it was not a big agency at the time and we had no assistant directors. There were just a director and a deputy director and about six division chiefs and a dozen independent senior specialists. As deputy director, I was de facto chief of the Senior Specialists Division and they all reported to me.

Well, anyway, that does bring us up to my work on the National Water Commission, which I consider the most important work I have done in water policy. Actually, the Kerr Committee had a much better reception and was essentially implemented within a few years which is unusual for a study commission report. The key reason was that the study was made by people who were in a position to influence the implementation of the recommendations, which is a lot different from a presidential commission where the appointees are appointed and do their work and then are gone.

The legislation for the National Water Commission was passed in September 1968. It was proposed in the comments of the Bureau of the Budget on the Bureau of Reclamation's proposal for a Lower Colorado River Basin project. This project was proposed after the end of what we used to call the "long suit," the Arizona versus California law suit over the division of the waters of the lower Colorado River.

The flow of the river had been more or less allocated between the upper and lower basins by the Colorado River Compact in 1922. Of the 7.5 million acre feet allocated to the lower basin, California was to have 4.4 million acre feet, Arizona was to have 2.8 million acre feet, and Nevada was to have 0.3 million acre feet. In addition, Mexico was to have 1.5 million acre feet. Projects to allow the upper basin states to use its 7.5 million acre feet had already been authorized, so it was quite obvious that there wouldn't be enough water for all of the projects, since the average virgin flow was down below 13 million.

When you allowed for Mexico's allotment, there wasn't nearly enough water. In the meantime, California had started using, oh, something over 5 million acre feet. The Supreme Court decree had set up a procedure for allocating the shortages, but I won't go into that because it's a very complex decree.

But the Bureau of Reclamation moved right in after the decree was made final and proposed the Lower Colorado River project, which at various times and through various stages involved Bridge Canyon Dam and Marble Canyon Dam bracketing the Grand Canyon National Park on the Colorado River. Glen Canyon Dam had already been built near the division point between the upper and lower basins and provided storage for the upper basin to make its delivery to the lower basin.

When it made its recommendation for authorization of the Central Arizona project, which was to be the primary user of Arizona's water, and if there obviously wasn't enough water, the Bureau of Reclamation had a very simple solution. In the same legislation, they proposed authorization of studies of means of augmenting the water supplies in the Colorado basin. This could only be interpreted by the people of the Pacific Northwest as a threat to their water supplies by diversion from the Columbia River basin. Scoop Jackson stood guard against this eventuality in his position as chairman of the Interior and Insular Affairs in the Senate, so the authorization was not likely to be enacted.

The authorization of the studies could obviously have led to recommendations for very expensive water projects, which was anathema to the Bureau of the Budget. So in commenting on the Bureau of Reclamation's report on the Lower Colorado River project, which is primarily the Central Arizona project, Elmer Staats signed a letter saying before we authorize anything like this, we ought to have a study of all the water problems in the whole country and evolve policies for future water development so that we don't get into this procedure of authorizing something which becomes essentially a blank check for a lot of further studies, which will require a lot of money to implement and particularly a lot of money to solve the problems.

So this letter was sent up to the Congress with the request for authorization of the Central Arizona project. Carl Hayden was still in the Senate, still the president pro tern, so there wasn't any question that the Central Arizona project was going to be authorized. There were enough chits out on that, so the votes were going to be there. And so the legislation for the National Water Commission was authorized. The authorization for the commission at one time was in the same bill as the Central Arizona project, but they took it out and they had a separate bill.

There had been several earlier efforts on the part of a congressman from California to authorize a water resources study. I cannot remember his name, but he had introduced a bill calling for a national water commission to evolve water policy. And it had probably been introduced in 1965 and again in 1967, but no action had been taken. I don't even remember for sure who introduced the National Water Commission Act on the Senate side, but it was probably introduced by Wayne Aspinall by request on the House side.

On the Senate side, I think the bill went through right away without any problem, but on the House side, Wayne Aspinall had some problems with it. I think I told him I didn't see the need for the study because it seemed obvious to me that water resource policies were going to continue to be evolved on a case-by-case basis, such as the Recreation Act which you mentioned, the Wild and Scenic Rivers Act, and for specific projects. The one comment that I made was that if this was going to work, you had to put the full responsibility in the chairman, subject to general policies laid out by the commission. This was based on my observation of the Water Resources Council, which I didn't think was working very well because the chairman didn't really have any authority. While he had appointed the executive director, it appeared that each of the other members of the council had appointed an assistant director from his agency, and it was not at all sure that the staff was independent.

The only other input that I had to that act was to recommend that the commission's report be sent simultaneously to the President and the Congress.

The Central Arizona project legislation was passed first, and the National Water Commission Act was passed soon afterward in late September 1968. Scoop Jackson had a lot to do with the negotiations that led to the appointment of the members of the commission. In fact, at one time a draft of that legislation had called for the members to be appointed by the President and confirmed by the Senate, however, it was argued that it was not appropriate for members of a study commission to be confirmed by the Senate. When they took that provision out, the legislation stalled and it was rumored that Scoop wasn't going to let it pass until he knew who the members were going to be. One of my colleagues called it preconfirmation-all of the members confirmed by Scoop Jackson before he'd let the legislation pass. It was quite obvious that they knew exactly who was going to be appointed because the appointments were made soon after the bill was passed.

The membership was very well balanced politically, geographically, and environmentally. The chairman was Charles Luce, chairman of Consolidated Edison of New York, who had been Under Secretary of the Interior. Then there were Russell Train on the environmental side, Ray Linsley, a professor of civil engineering at Stanford, and Frank Diluzio, from industry who had worked in government on the saline water program. Another industry representative was Mike Wright, chairman of Exxon U.S.A., from Texas. Sam Baxter, a civil engineer who was chief engineer of the Philadelphia Municipal

Water Department, and Clyde Ellis, a public power man and former congressman from Arkansas rounded out the group. I think they were well balanced politically, three Democrats and three Republicans, and nobody ever knew where Ray Linsley fit in, but I remember he supported Common Cause. None of the original commission's work ever had anything to do with partisan politics.

National Water Commission

Q: How did the committee interpret its charge? What did it set out to do?

A: I don't know what they did at the first two meetings of the commission in the fall of 1968. I don't think any record was made because they didn't have a staff. I met with Chuck Luce for the first time when he telephoned me and asked me to come and talk about the commission. He was staying at the old Wardman Park Hotel, now the Park Sheraton, in a very nice suite looking out over the trees. At that time, I hadn't applied for the position of executive director. I can't remember ever applying for a job after I took the civil service exams when I was in college. Somebody always asked me to come for an interview. And then I'd fill out the application blank. It was funny, but I never really did apply for a job, except unsuccessfully during World War II when I was unhappy at the Bureau of Reclamation.

So I went and talked to Chuck Luce without any commitment because I did know a lot about the legislation. I was still at the Library as deputy director of the Legislative Reference Service and we were getting ready to plan for our new offices in the Madison Building which had just been authorized, and I was having fun doing that.

One thing had happened which made me think I would not be interested in the job with the commission. For one thing, there had been a disagreement on the compensation of the staff when the first draft of the bill was sent down to the executive branch for comments and the Civil Service Commission had demanded that it be given control. The Congress didn't like that for a short-term presidential commission but finally compromised by putting in the legislation that the Civil Service Commission shall determine the compensation of the executive director. Then the executive director could fix the pay for the rest of the staff without regard to the civil service rules and regulations.

I was already compensated at the equivalent of grade 18 under Public Law **3 13** in one of the two top scientific jobs at the Library which more or less kept pace with the top scientific positions in NASA, and it was expected that the pay would go higher. So I couldn't see that there'd be any promotion for me at the National Water Commission, and there was an indication that the Civil Service Commission would never agree to another grade 18 position. At that time they were all allocated by the CSC. I guess it was just a coincidence that so many of them were in the Civil Service Commission. If you look at the record you will see that they had more super grades, proportionally, than any other agency. This was before they had the Senior Executive Service.

So I wasn't really interested in leaving the Library. But several people talked to me, including Ken Bousquet who was on the staff of the Senate Appropriations Subcommittee on Water Resources and Gene Wilhelm who had a similar position on the House side. They both encouraged me to apply for the positions, as did Sid McFarland, staff director for the House Interior Committee. I don't know whether Gene Wilhelm or Ken Bousquet had anything to do with it, and I never asked them, or whether a member of the appropriations committee was responsible, but the committee wrote into the first appropriation for the National Water Commission an executive level IV position for the executive director.

Probably they were angry about the Civil Service Commission's having been obstinate in demanding that everything be in accordance with civil service rules and regulations. So they wrote into the appropriations act providing the first $150,000 to start the work of the National Water Commission that funds shall be available for compensation of the executive director at level IV of the executive schedule.

I guess I must have known about this when I first talked with Mr. Luce. However, I think we talked mostly about what the committee should do, and I must have told him that I didn't have any preconceived ideas as to what should be done. But I'm sure that I told him about my experience with the Senate Select Committee which had decided against doing the things that I thought were most important, such as the economic analysis and the allocation of responsibilities among agencies. At that time I thought those were the major problems.

So anyway, when I met with Mr. Luce we eventually discussed the subject of salary of the executive director. There was another Quadrennial Commission report coming up, and he suggested that it seemed obvious that they were going to make some recommendations for increasing—

Q: What sort of commission-I'm sorry, what was this?

A: The Quadrennial Commission is what they called the Commission on Executive Pay, which has just recently made some new recommendations-that's what they used to call it. Now, I don't know whether they still call it that or not. I think somebody did call it that in the newspaper article. It has a long name. Well, anyway, that was in the mill, and he felt sure that the level IV would be a promotion for me. The executive level V was the same as grade 18, and so it seemed obvious that there would be a promotion.

As soon as I met with Mr. Luce, I found that we had an almost immediate rapport. But I have to mention one thing; someone had told me that he had had polio. He walked with a limp, the same as I do. All my life I'd wanted to find somebody whose left foot was smaller than their right foot, especially size 11 or 11½, in the hopes that we could buy two pairs of shoes and split them because my right foot is smaller than my left foot. But unfortunately Chuck's polio was in the right leg also. He was attacked by the polio just about a year before I was when we were both babies.

I guess I'm just being facetious bringing that up. But we did have a good rapport. He had come out of the Interior Department having been in the Bonneville Power Administration when I was in the Pacific Northwest. We knew a lot of the same people and he knew and loved the Northwest just as I did. We both knew and liked Scoop Jackson. He had been my congressman when I lived in Seattle, and when I came back to Washington I still voted in Seattle until the District of Columbia residents were able to vote. Of course, I had worked with him when he was a member of the Senate Select Committee.

One of the interesting things that Scoop did that I was involved in was he brought young lawyers back to work with the Interior Committee. He brought Tom Foley back, and he brought Bill Van Ness back, and one of the first things he usually did was send them over to talk to me at the Library about water resources, so I got to know and work with Tom Foley, for example.

Q: While he was still a staff member?

A: Yes, he was a staff member on the Senate Interior Committee for several years. I don't know whether Scoop had any idea that Tom was going to go on and be the majority leader or anything like that, and I certainly didn't. Tom was just a very nice guy. And Bill Van Ness was very nice and stayed on to be staff director of the committee.

And then on the other side, Tom Kuchel had brought Steve Horn back to work for him, and I did the same thing; spent some time briefing him on water resources because I could give them a briefing about the committee from a different viewpoint and the senators were a little too busy sometimes to break in a new staff member.

So I had a good rapport with Scoop Jackson, but I never talked to him about the commission more than once or twice during the course of the five-year study.

When Mr. Luce offered me the job after another unrecorded meeting of the commission I agreed to take it and started work on the next to the last day of 1968, bringing with me a secretary from the Library of Congress. I was working in a building at 1016 Sixteenth Street across from what I still call the Statler Hotel, now the Capital Hilton Hotel. The government had a small building there, an eight-story building with just a few offices on each floor that they used for temporary commissions. I had the office on the second floor at the front of the building and planned to meet there with Mr. Luce on the first Saturday after I started work.

I had to use a key to get in the building on Saturday and was up there working when I kept hearing something that sounded like hail on the window, a tapping noise. I looked out the window, and there was Chuck Luce down on the sidewalk throwing pebbles up against the window because he couldn't get in. And I thought, "My god, if the police come along and found the chairman of Consolidated Edison Corporation down there throwing pebbles up there, they'd probably want to lock him up."

I went down and let him in and we started to talk about what we should do. As I think back on it we certainly didn't "hit the deck running." We had talked a little bit about what should be done in the interview, when he had asked me

what I thought should be done, and I had gone through the whole rigmarole of cost sharing and allocation of responsibilities among agencies, as well as a lot of the other things we've been talking about today, which were things I had been working on for years.

All we could agree on at that time was that we were going to have to have a program of studies looking at specific areas in some depth to provide a basis for making recommendations. Which, of course, was so obvious that we didn't need to have a meeting to decide it, but I was there with one secretary and no staff at that time and had barely begun to think about who I was going to get to help me, and I didn't even have any stationery on which to write a letter. We had to type on the address.

On Monday Bob Blakeley, who was the administrative man for the Corps of Engineers, called me and offered to help with administrative details. I don't know whether he was operating on his own or whether somebody at the Corps had told him to call me. I think he was hoping to get the job as the administrative director for the commission. I don't know what motivated him, but he came over and helped me. He helped me get stationery, he helped me get anything that I needed in the way of office furniture and equipment. He told me that the Corps was glad to help, and that they had helped a lot of commissions. He mentioned the names of some of them.

Of course, for presidential commissions, the General Services Administration has an office set up to handle administrative details: payroll, personnel, contracts, etcetera. That's the rule. But Bob Blakeley could do things so much faster than GSA. My recollection is that he got my stationery printed in one day, and a dozen little things that you have to do to get an agency started. To be honest, I guess I was terrified. Here I was, with one little secretary who had been one of my assistant secretaries at the Library and when she knew I was taking a new job, she asked to come with me. She was only 18 years old. When she bought a car, her father had to sign for it because she was too young. But she was good! She could take dictation and was a very hard worker. But she didn't have any background about the federal government: a high school graduate, no college.

One of the first people I had contacted to see if he would be willing to work with the commission was Howard Cook. I was told that Howard Cook had been interviewed to be the executive director, along with Joe Tofani and Gene

Weber. They were all three very knowledgeable, but I didn't know whether they would like to work under me. I have a feeling that it really hurt Howard that he hadn't been selected, but he never complained about it.

When I called Howard, he immediately said that he'd be interested, and I offered him the position of deputy director because I knew that he could be depended on and I would be able to get him a promotion.

The Corps had great difficulty getting super grade positions, GS-16, -17, and -18 at that time because of the overlying military staff. When you looked at the organization chart, the responsibilities were placed in the generals and colonels. At that time they even had several colonels as assistants to the chief of Civil Works, so they had a hard time justifying getting a super-grade position for a civilian in the Corps. The only way that Joe Tofani got a GS-17 out of it was that Ken Bousquet got the Appropriations Committee to write the position in the law in the appropriations act. I understand that logjam has been broken now, but not without great difficulty.

I was delighted to provide a chance for Howard to break out of that, and so I think that's one reason he took it, but also he was highly motivated. So he was the first person with whom I really made a commitment. He couldn't get away from the Corps right away, but he came over and worked with me Saturdays and nights and whenever he could find time and helped me to lay out a list of potential studies to be included in a program of studies for approval by the commission.

Neither Howard nor I wanted to narrow the focus of the study down into our particular areas of interest. Under the terms of the National Water Commission Act, the commission members could not be affiliated with the federal government in any other way. Chuck Luce wanted me to follow the same principle in hiring the staff. He didn't want me to detail people from the agencies who might retain ties to their agency. He reminded me that the Water Resources Council had been staffed that way and that it didn't work. Chuck did not have a very high opinion of the Water Resources Council, based on his exposure to it as Under Secretary of the Interior.

Although he had delegated all of the powers of the chairman to me except the power to hold hearings, I felt that I had to consult him with respect to hiring my principal deputy. I pointed out that I had worked with Howard for many

years, that he had unusual competence, and that he had worked not just for the Corps but for the Department of Agriculture. So he agreed that I could hire Howard Cook.

So we went to the first formal meeting of the commission, just Howard and I, with a list of over a hundred possible study areas. We made up the list based on our knowledge of all the different questions that were still left after all the other studies had been done. When you get right down to it, most of the previous water studies had not really resolved any questions; they had more usually posed more questions or different questions.

Q: Let me inject a question right here. When you developed these potential study areas, did you go to staff members in the House and Senate and ask for some input from either the political, that is the elected officials, on the Hill or the staff members about what was their intention?

A: Not at that time. For one thing it was abundantly clear from the legislative history of the act what we were supposed to do. I wanted to have a meeting with the commission first. I hardly even know the other members of the commission, except for Ray Linsley and Frank Diluzio. I had met Russ Train once or twice, and I knew Sam Baxter from having served on a committee with him when he was president of the American Society of Engineers. But I didn't know Mike Wright, and I didn't really know Clyde Ellis although I had heard him speak.

So, I wanted to get their views before I got anybody else's because I wanted it to be their show. The first meeting was held at the Metropolitan Club over a $15 lunch which shocked me because the food wasn't very good. We had given the commissioners the list of studies in advance, and we asked for guidance as to which areas they thought should be the subject of study.

My whole approach backfired when the commissioners immediately turned the question back and told us that we were the experts and they expected us to tell them what they should study. But at that first meeting, Chuck said that the one essential thing was that we have at least one study underway and a plan of studies approved by the time he went up to testify before the Appropriations Committee for the next year's appropriations, which was set for some time in March. This was in mid-January, so we had only two months to come up with

a plan of study. And it was pretty clear that the commissioners had no preconceived ideas about what this commission should do.

One of the things that they did understand was that we would have to study interbasin transfers because of the background of the commission. Actually, we were the only federal agency that could study interbasin transfers because of Scoop Jackson's provision in other legislation to the effect that no agency shall study interbasin transfer without specific approval of Congress, and we had that specific approval in the National Water Commission Act.

Although at first we didn't get the specific views of the commissioners as to what we should study, there was no lack of suggestions sent in from others. Professor Len Dworsky at Cornell sent us a publication resulting from a student project that he called, "An agenda for the National Water Commission." I was deluged with all kinds of ideas from other sources. People from TRW met with us, wanted me to contract the whole study out to them, and they would plan it and execute it and produce a report. All we had to do was give them the money. I was flabbergasted. I couldn't conceive of such a thing. But apparently they had done that for some other commissions. From the current vantage point, I guess it would be called privatization.

It was obvious to me that none of these people had anybody that knew any more about water policy than Howard Cook and I did, so we soon stopped paying any attention to them and devoted our time to recruiting a staff. And for the first study we took advantage of some water demand studies that were already underway at Resources for the Future and began negotiating a sole-source contract with them to provide us with a report on future demands for water in three sectors of the economy. This was one of the very obvious things that we knew would be needed. It didn't take much time to draw up the contract, and it didn't cost very much because Chuck Howe and Bob Young, who were going to do the work, were already working at Resources for the Future. So this became the first study, and when Chuck testified at our appropriation hearings, it was already under contract.

In order to handle our contracts, I very soon hired an administrative man. The job didn't pay enough to attract someone like Bob Blakeley, but I was able to hire a man with experience with defense contractors as the administrator. His name was Bob Baker, and he went right into action because he knew contracting from both sides, having been a colonel in the Air Force or Army

Air Force during World War II and had worked in the Pentagon Office of the Secretary of the Army. He was able to hit the deck running and knew all the personnel rules when we started to recruit the rest of the staff. We had to get that first contract going before we even had the rest of the staff. We didn't have very much space in the office at 1016 Sixteenth Street, so they made space available for us in the New Executive Office Building on Seventeenth Street. This was very nice office space which made me feel that the commission was going to be right in the middle of government policymaking.

We could have the commission meetings right there in the office and walk across the street to the Metropolitan Club for lunch. But in the meantime, Russell Train had resigned from the commission to accept an appointment as Under Secretary of the Interior, and Howell Appling from Portland was appointed. This started to upset the geographical balance of the commission because we lost an Easterner and picked up another Northwesterner. Howell was a businessman, and he very quickly developed an understanding of what we were trying to do.

Q: Who appointed Appling?

A: He was appointed by Nixon. He had been a campaign worker for Nixon in Oregon. At one time he had been the lieutenant governor of Oregon but he had given up politics because he felt that it took too much time away from his family. I had not been consulted; we read about his appointment in the newspaper.

After a couple of months in the New Executive Office Building we were told unceremoniously that we would have to give up that office space.

Howell Appling knew H.R. Haldeman and John Ehrlichman, the two guys that ran the Nixon White House, and wanted to put up a fight to keep our office there, but Chuck felt there was no use getting involved with that kind of a fight. I think Chuck realized that we had no political clout, since all of the other commissioners had been appointed by Lyndon Johnson and had submitted pro forma resignations to Nixon on January 20.

In the meantime, we were going ahead with the evolution of the study program. I had already contacted Abel Wolman, Gilbert White, and Ed Ackerman, and they had agreed to serve as consultants. All three were very

well known to Howard Cook, and we tried to get their ideas as to how we should, narrow the focus of the study. I think we had just one meeting with all three of them, and they weren't able to help very much.

I should have mentioned earlier that on my first day of work for the commission on the last day of December in 1968, I had worked up the justification for a budget of $700,000 for the next fiscal year. I was able to get it printed in the budget which was going to press that very day, so we didn't have to go up with a supplemental which might have taken ages to get.

So we had a budget request without having had a Budget Bureau hearing, which is rather unusual. We did have a hearing on the Hill at which everything was sweetness and light. We had the House and the Senate hearings on the same day, to accommodate Chuck who was very well respected by everybody on the Hill, and I guess I was also.

There's not going to be enough time for me to tell much of the detail about the study program that was being formulated during the early days of the commission. It was a rather full program because the commission refused to narrow the study down. Howard and I felt that we could not do a good job on over a hundred potential studies that we had on our list. These were all in areas of possible improvement in water policy, and the commission took the position that it couldn't decide to throw anything out without having the background that the study was intended to provide. Some of them were in narrow areas and some of them were broad. They were grouped into 15 or 20 special study areas which I thought would provide a focus for a rather succinct final report.

I was very fortunate in being able to assemble a very competent and hard working staff. The division chiefs were Vic Koelzer, from the Harza Engineering Company, where he had worked on multiple purpose projects all over the world but primarily in the United States; Lyle Craine, on a sabbatical from the University of Michigan, who had been in the Interior Department in the Truman administration as a member of the secretary's policy planning staff; and Phil Glick, who came to us from being chief counsel for the Water Resources Council. He used to joke about being called "counsel for the council." Each division chief then recruited his own staff. Phil was the last of the division chiefs to come on board, and his immediate reaction was he wanted to bring his whole staff from the Water Resources Council over. I had to stop him from doing that, and he eventually recruited a very fine group of Western

water lawyers. Aside from this instance, I generally gave each division chief a free hand in staffing his unit, within the limits of the budget.

Q: Was Gary Hart one of your lawyers?

A: No, but he made a study for us. The star of the legal staff was Charlie Myers, on detail from Stanford for about a year. Charlie Myers was a very dynamic individual, very, very conservative, an arch-Republican. He was originally from Texas, where he had gone to law school, and was a professor of law at Stanford. He was topnotch and dominated the legal staff.

Q: Was he a friend of Linsley's?

A: Not really. Linsley was at Stanford and knew Charlie, but they were not especially friendly. I think Phil Glick recruited Charlie. Phil's primary role was in recruiting a topnotch staff. With all due respect, Phil Glick was more of an executive lawyer. He knew how to find people and how to interpret other people's work, but he was detached from the report production line. Charlie more or less took it over and helped with the completion of the final report. I think Phil was on leave for a long time after an operation.

Q: What did Gary Hart do?

A: Gary Hart was engaged. to do a study on the river basin commissions which was eventually published. We had a hard time getting him to finish it because he went to work on George McGovern's campaign.

Q: You were talking about how the staff was hired, but what interests me is how the staff, including the in-house staff as well as the contractors, developed the voluminous number of studies in really a relatively short period of time. You must have had quite an administrative problem of handling all that sort of stuff.

A: Yes, I did. At one time I remember telling the staff that, "All I can do is facilitate the work and get the money and whatever else you need to do it, and I don't really have the time to put a lot of intellectual capital into the theory and the policy."

Howard and I worked very long hours, and we had some other hard working staff people. Vic Koelzer told me that he woke up at four o'clock in the

morning because he couldn't sleep, so he started working and worked all day. When I mentioned the division chiefs, I forgot to mention that Bob Baker, as chief of the Administrative Division, did a yeoman's job in his field.

Also, we did a lot of the studies by setting up committees where our staff did the staff work. Harvey Banks chaired a committee on planning and Dwight Metzler chaired a committee on water pollution control. We knew the people in the country that knew the most about the various subject areas and we got them to help.

We negotiated contracts with universities for the use of people who were academics but had had experience with government policies. David Allee at Cornell was in charge of one study. He had been back in the Office of the Secretary of the Army for a year on sabbatical, so he was well versed on authorization and appropriations processes for water resources. I don't remember all the others, and there just isn't time to go through the whole list of studies. We actually had about 80 different studies of which 64 were completed and published. Then we had two major compilations that were published by the U.S. Government Printing Office. One was on state water law, compiled by Dick Dewsnup with the assistance of a couple other lawyers, and the other one on the federal water policies, which was done by in-house staff.

I had the feeling that I was keeping a lot of balls in the air. My efficiency was helped tremendously by the fact that I had two secretaries. In addition to the young woman who had come from the Library, Lena Crist, who didn't have much experience but worked very hard, I had Flo Broussard who had been Ed Wenk's secretary at the Library and had worked with him in the Executive Office of the President. Flo was my administrative assistant-the only fault she had was that she typed so fast that the IBM Selectric typewriters with the letters on the balls couldn't keep up with her. I shouldn't call that a fault!

IBM didn't believe it, and they sent someone to the office to check her out and found that it was true. The machine just could not keep up with a really fast typist. Not only was she fast, but she was accurate, almost unbelievably accurate. When I wanted to get something done, I could dictate it and it would come out perfectly. She corrected my tendency to be overly verbose. I have the feeling we could use her to good advantage in transcribing this interview.

We had a commission meeting just about every month after the studies were coming in. Usually the meetings would start in the evening with dinner and a discussion of some kind after dinner. Then we'd have morning and afternoon sessions the next two days concluding about three o'clock in the afternoon of the third day. Some of the earlier meetings were just one day. I tried all different ways of doing the minutes of the meetings. One time we even had the tapes transcribed, but that took too long, and they had to be edited. So finally I just made notes as we went along and then I would come back to the office and dictate the minutes.

I have had a lot of experience working with commissions and committees, and sometimes they don't really take some action that they should take or they forget to do something that they intended to do. This commission was no different. My philosophy has always been (I hope it doesn't sound like David Stockman) to write the minutes up as to what I thought the sense of the meeting was and what the committee and commission should have done rather than what the actual transcript showed. You sometimes have to do it that way; otherwise, you'd never have a good record of the actions taken.

Preparing the minutes took a lot of my time and I could never have done it if it hadn't been for Flo Broussard. She was very competent. She didn't work overtime, she didn't have to. She could do all the work in eight hours. Mr. Luce thought she was overpaid compared to his secretaries at Con Ed, but she earned every bit of her pay. She went on after she left me to be secretary for Russ Peterson when he was chairman of the Council of Environmental Quality, and then later on she was secretary to the science advisor in the Executive Office of the President. She was topnotch, and that was one of the reasons I could get so much work done.

We didn't have many meetings with consultants, but we did have one big meeting at Belmont to which we invited members of the committee staffs from House and Senate committees and from the minority and majority sides. This was probably in the spring of 1969 when we were first getting started. We also held field hearings, about five or seven hearings at various places around the country. I can remember going to Portland, Denver, Phoenix, and New Orleans. Every state was invited to make its views known at these hearings, and we amassed a tremendous volume of material. This is always an essential part of a commission study. But you get an awful lot of material, most of it about things you already know, that you can't use or don't need to use.

Sometimes you get a few good ideas, and it also helped us to determine that we were covering the things in which the states were interested.

Throughout the study I had to spend a lot of my time meeting with people who wanted to make an input to the commission's study. Some of them believed that the major purpose of the study was to beat the drums for the NAWAPA project, the National Water and Power Alliance, that was proposed, I think, by the Ralph Parsons Engineering Company. I also felt like I was flogging the administrative staff and the section heads to get them to finish individual reports so that we could get them published and get them out for comments.

Along with the work of the staff, we were having a meeting of the commission almost every month at which we would keep them up with what the staff was doing. At first we were evolving the study program and having postmortems on the hearings. When the first studies started to come in during the second year of the commission's work, we sent copies to the commissioners and discussed them at the meetings. The commission did quite a bit of reading of those studies and gave us all kinds of comments. As we moved on farther down the road and were at the point of making decisions as to what would go into the final report, we would put issues before the commission in the form of a staff paper. One of the more significant staff papers was the paper on alternative futures. It seems so obvious now, but at that time it seemed like a new idea, that demand for water is dependent on the policy decisions made by society, not on the growth of the economy.

Everybody knows that now, but when work was done for the Senate Select, there was a consensus that water demand was going to be doubling in 20 years and tripling in 40 years along with the economy.

The commissioners worked very hard to prepare for those meetings. Mr. Luce demanded detailed agenda with estimated times for consideration of each subject based on my estimate of its importance. We prepared an agenda book for each meeting. Some of those notebooks were two inches or two-and-a-half inches thick. I was embarrassed sometimes because Chuck Luce had always read every word of the agenda book and the reports it contained, and he would ask me questions about things that were in the book that I either hadn't read or didn't remember having read. He had a much better retention of detail than I.

Most of the other members of the commission also were topnotch people. Mike Wright was an intellectual power house, or maybe he had a very good staff to brief him. Strangely enough, even though he had been a staunch Republican all of his life, the White House staff, without me knowing anything about it or anybody else on the commission knowing anything about it, got the President to replace him on the commission.

When Nixon came into office, each of the commissioners had written a short undated letter saying, "In accordance with established procedure, I hereby submit my resignation to be effective at your pleasure." This is standard for all presidential appointees, even in the middle of an administration when the new administration starts. I understand that some Presidents demand that appointees give them that letter when they are appointed.

So, those undated letters were all on file, and the first thing I knew about it was when I got a call from the White House telling me that there were some important papers for me to pick up. When I got them, I found there was an appointment for Josiah Wheat of Texas, who had been chairman of Democrats for Nixon in Texas, and another for Roger Ernst of Arizona, who had been an Assistant Secretary of the Interior. Along with them were letters accepting Mike Wright's resignation and Frank Diluzio's resignation.

When I called up Mike Wright, I think he thought that I was the one that wanted to get rid of him. This was the farthest thing from my mind because he had been a tower of strength in supporting me when other commissioners came up with unrealistic ideas. Frank Diluzio just shrugged when I called to tell him, saying that he was surprised that it took as long as it did.

This happened in November 1969. We were well under way, and we had two new commissioners, and they didn't know anything about the study program.

Roger Ernst from Arizona was well versed in government procedures, having been an Assistant Secretary of the Interior, but Josiah Wheat's primary connection to federal water policy had been through the Water Resources Congress and the National Reclamation Association in Texas. From their backgrounds I thought they might want to change the focus of the commission to make it a strong supporter of Western water development.

By statute, the commissioners were allowed to be paid for the days that they worked. It was decided early on that no commissioner would charge for more than four days a month, two of which would be for the meetings and two days at home. So these positions were no sinecures. Further, we didn't provide for a commissioner to have a paid staff person in his home office,

Q: That would exclude travel days, I assume.

A: Yes. Because of that limit, they didn't charge us for travel time. Most of the commissioners were going to be traveling anyway. They were all very busy people, so $100 a day was more or less pocket money for them. We did authorize them to travel first class, and they all traveled first class except Chuck Luce. He always traveled coach. As a director of United Airlines, he did that because he wanted to see how they were treating people who rode in the back of the plane. I was also authorized to travel first class, but I always traveled coach because I hate to waste money. I kept a very tight rein on the expenditures of the staff of the commission.

Q: What surprises me is that considering the number of people you hired and the number of people you contracted with, in the end you could come up with X number of recommendations that must have reflected at least a majority view if not the unanimous view of the commission. And these recommendations were not just milksop; they were substantive and they were controversial. Can you explain a little bit more about how that evolved?

A: We worked pretty hard to get unanimous decisions. Of course, the staff didn't have a vote. And we had some studies that were never finished because they weren't any good. For one study we contracted with the University of Chicago for work that Jack Schaefer was going to do. Jack Schaefer then left the university, and they turned the study over to someone else. The study was on the Muskegon project in Michigan. It was such a lousy report and we had already made a partial payment which couldn't be recovered, so I refused to pay any more and ordered the contract terminated. We were threatened with legal action by the University of Chicago, but in a phone call from the vice president of the university, I turned the threat right around, saying, "If you pursue this, I will publish that report and put the name of the University of Chicago on it." And I told him to look at the report and let me know if he wanted me to do that. Never heard another word from him.

That is an example of what I meant when I said I was tight. Another thing is that we refused to pay overhead on contracts with the universities. They passed a resolution condemning the practice. I was determined not to waste any money. One time we had to send Helen Ingram up to Cornell to help David Allee to finish his report. David always has a lot of balls in the air. He's a very good man and the contract was being monitored by Helen so she had to go up and more or less sit on his doorstep-not really his doorstep, but hound him at his office to keep him working to get that report finished in time for the commission to consider it. Dave didn't really understand that when we needed a report for a meeting of the commission in May, they wanted to get that report in advance and read it. We worked hard on a lot of those reports to get them finished on time. I mentioned earlier that we had trouble getting a report out of Gary Hart because he was working as McGovern's campaign manager. We had to get somebody after him to finish his report, but we got it and he came to our meeting in Philadelphia to defend it before the commission.

Q: Excuse me, but did it sit well with these staunch Republicans you were talking about that Gary Hart had been given a contract? It would seem likely to me that some of those people would say, "Well, gee, this guy's a little bit too far to the left to really be-"

A: I remember that some of them joshed Gary at the Philadelphia meeting about working for a losing cause, but there was never any political comment made at any of the meetings or at any other time. And one thing that amazed me was that there was never any political pressure on me to hire anybody. One of the people that I tried to hire at the very beginning of the project was Ernie Englebert, out at the University of Southern California. He'd written a lot on water resources policy, and I've known him for many years and respected his work. When I tried to get him to come to work in the position in which we eventually hired Lyle Craine, he said something like, "I'm not going to come back there. You're going to find that you're going to have to hire every political hack that the Hill sends down there, and you're not going to be able to get anything done."

The amazing thing was that, to my recollection, I only had three calls from the Hill about hiring a staff man.

One of those calls was about a man who had applied for a job with us, and I had agreed to hire him but we had not yet told him. He went up on the Hill to

one of the senators that he thought had some influence to ask for support. So I got a call from a staff man urging me to hire him. Actually, I think someone on my staff had already made an offer and he'd accepted it when I got this call. If I had gotten the call before we had made the offer, I'm not sure I would have offered him the job because that's the way we operated at the Library of Congress. We would never hire somebody with a political recommendation. I suppose we might have if the recommendation came from the chairman of the Library Committee. Then we might have hired him and put him in a place like kicking him upstairs before he started.

Then I also got a call from Scoop Jackson about a young man who wanted a summer job. We interviewed him and he looked good, so we hired him as a research assistant. I guess we trained him well, because he's turned out to be a leader in the water resources field. I'm glad we were able to help him along in his career. It was a summer job for him.

Q: What was his name?

A: I can't remember for sure, but his first name was David. Yes, David Friedman.

Q: You said you got three calls?

A: Yes. It's funny that I remember all this, but I never could understand why officials of the executive branch of the government allow themselves to be pushed around by members of Congress.

Anyway, this other call was from a staff member for a senator that I knew quite well. The caller said that the senator was interested in so-and-so and wanted me to hire him. This was a staff person for whom I didn't have much respect, so I said, "There are no vacancies, but if the senator is really interested, have him call me and I'll talk to him about it." I never got a call back. So it was pretty obvious it was all being handled at the staff level.

I was very careful in hiring the staff. There were probably a couple of mistakes made, but that was inevitable considering the time pressure we were under. Actually, I was primarily responsible only for hiring the top staff people. I hired Howard Cook as my deputy and I hired Ralph Fuhrman as an assistant director, and, of course, Bob Baker to handle the administrative work. After I hired the three division chiefs, I let them pick up their own staffs. But I

would always interview the candidates, and if I didn't think they were making the right decision, I would give them my comments. In a couple of cases they went ahead and hired people that I didn't think were competent anyway, and in at least one case it was a terrible mistake, which was recognized by everyone later. But I think the record shows that we had an excellent staff.

Vic Koelzer brought a lot to the commission. Vic is the one that set up these committees chaired by Harvey Banks and Doug Metzler and people like that, bringing a hand-picked group of top experts together to develop reports. His committees worked very much like the committees of the National Academy of Sciences, and they really produced for us. That was how we got some of the reports done. Then there were internally prepared reports. The report on navigation that Truman Price made for me was a real classic. He made a special copy for me with pictures of nude women sunning on the decks of yachts and things like that that made you laugh. The idea was to show the multipurpose use of waterways. I got a kick out of it, but we didn't leave those pictures in the reproduced copies made for the commission and eventually published.

Truman had a great sense of humor and I think everybody did. He had come to us from Interior. I wasn't able to honor Mr. Luce's idea of not getting people from federal agencies. We had to get people who knew the programs because we didn't have the time to train them. One reason that Vic Koelzer and Lyle Craine worked so well was because they had had federal service in an earlier stage of their careers.

The rule I followed was that we wouldn't hire anybody who was planning to go back to his job in a federal agency. There was a young officer from the Corps of Engineers, for whom I had great respect; he was probably a captain at that time. He came to me and said that if I wanted, he could be detailed over to work for the commission. I know he could have helped, but I decided not to take him up on his offer because he would have obviously gone back to the Corps. We didn't take anybody on detail from federal agencies.

When Truman Price came, he severed his ties at Interior. Later on he went over to work for EPA [Environmental Protection Agency], but that was different. EPA was not even in existence when he came to us. Howard Cook was planning to retire, which he did near the end of the commission's life.

It's hard to say how we got so much done. One of our failings was that the commission didn't narrow things down. They wouldn't let go of anything that we started. Incidentally, the report was unanimous except that there was one dissent on an item where the commission recommended that water rights ought to be only for a set time; in other words, for enough time to amortize the investment, rather than in perpetuity. The commission's recommendation gives the option of reallocating water without paying somebody to give up their water rights. Roger Ernst, as a dedicated Westerner, dissented from that. That is the only dissent in this whole report. Such unanimity was not achieved without an awful lot of work, and believe me, these members worked.

The commission really got started in about January 1969. I worked the last few days of December in 1968. We had 54 meetings, including the hearings, some of which were two days. Almost all of the meetings in Washington were two or two-and-a-half days. We did have a few one-day meetings. Counting all 54 meetings and hearings, the attendance record was something like 89 percent.

Q: Amazing.

A: Just amazing. Due largely, I'd say, to Luce's leadership ability. He did so much work himself that he really inspired everyone else. I understand that he's been like that on every job he's ever had. So I would attribute the success of the commission to his leadership and the hard work of the staff-especially during the preparation of the final report, when the staff was very diminished because we told everybody when they came to work that it was for a set time. About a year and a half before the end of the commission, I set up a schedule of when people were going to terminate their employment and what they had to finish before they left.

With only one major exception that I can remember, they did it. They worked right up to the last day if they had to and finished their reports, I have to particularly give credit to Vic Koelzer. Because Vic was one of our highest-paid people, we had to let him go before he wanted to go. He had wanted to be in on the final writing of the report. He was an engineer who knew how to get things done, and the reports for which he was responsible were in such good condition that we didn't really need him any more. So he left kind of reluctantly, being one of the first staff members we had to let go.

Some of the others had come in and out. Henry Vaux was one of the first ones hired and had gone to the University of California to take an academic position and complete work on his Ph.D. The names don't all come back to me, but others had come in and out. Lyle Craine had gone back to Michigan and had been replaced by Dean Mann, and then later Dean Mann had to go back to his academic job and Gary Taylor carried on there. We had the most trouble keeping staff in the Social and Behavioral Sciences Division. But we had a really good staff and they worked hard, but at the end I had to be the one to put the report into final form.

Howard had a major difference with the commission on the cost-sharing policy on inland waterways. Howard felt that the federal government should pay at least half the cost. The commission's recommendations were blunt. It believed that there is no reason that the federal government should be subsidizing transportation of goods and passengers who should be able to pay their own way. So the commission's recommendation was that only if the waterway was needed for national security should federal money be expended on improvement of inland waterways. I think it kind of broke Howard's heart when he lost an argument with the commission on that subject. So Howard Cook decided to retire; he was 68 years old, and his wife had wanted him to retire much earlier because she had already retired from Woodward & Lothrop. Howard had stayed on because he wanted to help me. He was very loyal to me.

It was near the end of the commission's life, the staff was dwindling, and I had the job of finishing up the report. We had hired an editor from Bonneville Power Administration named Mike Katz, who came in and worked for the commission for about a year. He was a good editor, and I think an awful lot of the credit for the good writing in that report goes to Mike Katz.

When it finally got down to the last few months, I took a few short cuts that I was able to do because I had contacts with the Joint Committee on Printing. The Government Printing Office is supposed to be responsible for printing all government reports. I couldn't see how we were going to get the report done before the beginning of summer if we couldn't bypass the Government Printing Office's red tape.

I had scheduled completion of the report for June, even though we had until September 26 to finish, for several reasons. One reason was that I wasn't sure that we had enough money to run through the summer. We had enough money

for my salary and the secretaries' salary, but not enough to do very much else. The other reason was that I was getting tired and wanted to have some relaxation in the summer. A third reason, which I hate to mention because it sounds crass, is that there was going to be a cost-of-living adjustment in the federal annuities on July 1, and if I were to get on the retirement rolls before then, I would get an increase in my annuity. This was at a time when inflation was increasing and I had two children of college age.

In order to meet my schedule, I had to short cut the Government Printing Office. We had all of the report on computers, so it was going to be possible to print it direct from the tapes. This was in the early stages of computerized printing, but I had investigated and found a commercial service that could use our tapes and go right into typeface. So I went ahead and put the review drafts of the report into the single-spaced form they would have when finally printed. This resulted in reviewers making fewer changes than if you have a double-spaced draft on which it is easy to interlineate and write in changes. So I worked from galley proofs from about the middle of April on.

At that time, you were not supposed to do that. You were supposed to give a copy to the Government Printing Office, and they would prepare the galley proofs. But I had talked to people that I knew on the staff of the Joint Committee on Printing and in the Government Printing Office and made sure that what I did was not going to be wasted. So we prepared the final commission report on galley proofs. Every member of the commission read every page of that galley through several iterations.

It was a big report, over 500 pages, and there are actually 238 recommendations spread through it. I was the only one left, except for Bob Baker and a couple of secretaries, working to get the transcripts of the hearings in shape and organizing the files containing 7,000 or 8,000 letters of comment about the draft report. We had put out a draft in October 1972, and this was in the spring of '73 that I was finishing the report.

I remember getting those galleys back from the commissioners and sitting at the big conference room table with seven galleys spread out before me, with one clean set that I was marking on. I would go over all of the commissioners' changes and incorporate them in the clean copy. There were places where I had to resolve differences in language changes proposed by different commissioners, and then send out another set of galleys when it was on a

controversial subject. I guess I realized that I was the only one could have done that, and so I did it, but I ended up working 80 hours a week or more. I was working all day Saturday and all day Sunday that whole spring to get that report done. With everybody's cooperation we finally got agreement on everything. Then I had the commercial service cut up the galleys and put the report into page proofs mounted onboards, mostly double pages, with spaces for pictures.

I had asked members of the staff to find pictures as we went along, so I had a whole raft of pictures from which to choose. We had pictures from many sources including the Corps of Engineers and the Soil Conservation Service and the Bureau of Reclamation. Every agency was eager to give me pictures because they knew they would get credit. We had been collecting pictures as we went along, but finally, in the end, I had to pick out the pictures and write captions, which Flo Broussard would type up and get to the printers.

Flo stayed with me until the end and I would have never been able to do so much without her. She was much more efficient than I. My other secretary had already left, and we had a very small staff at the end. I finally got the approvals of all the commissioners and got them to sign the front letter to the President and the Congress and had it set up for publication in the front of the report.

When I took the page proofs to the Government Printing Office all mounted on boards, they were somewhat upset, but I told them that because our computer was all set up to move right into typeface, we had done it that way to save money and time because it was the only way we could have it ready for a meeting with the President.

In the meantime, we had set the date for presenting the report to the President. It was to be June 14, 1973. I took the boards over to the Government Printing Office about May 25 and told them that we had a meeting set with the President for June 14 and that we had to have copies by then. It was the day before the three-day holiday weekend. I thought sure that they would start to work on it on Saturday, but apparently didn't even look at it until Tuesday. They put it out for bids on Wednesday. They had several bids and got a company out on New York Avenue to print it. Nobody would ever believe that the Government Printing Office could work that fast, but they did. I can't remember the name of the process—

Q: Offset?

A: No, I'm talking about the pictures. They're all in two colors.

Q: Duo-tint?

A: Yes, duo-tint. There's a blue and a black press run on all of those pictures. Gives a nice effect, and it's much cheaper than color printing. Anyway, it was all ready for them to print when we gave it to the Government Printing Office. Flo and I went over to the printers on Saturday and checked all of the captions for the pictures, which is one of those things that has to be done because they're set separately. By the next Tuesday we had a printed copy of all of the pages, not bound, for us to check before they proceeded with the binding. The next day we had a few paper-bound copies of the report, and on Thursday we got a few tons of reports almost a week before we needed them. But in the meantime, the White House had canceled the meeting. Just a joke-1 told the commissioners that Nixon was so engaged in Watergate he didn't want to have anything to do with anything on his calendar that had the word water in it. (Laughter)

So we never had a meeting with Nixon to present the report. But we did go ahead and schedule hearings on the Hill toward the end of June-By that time the summary report had been written. This was the report which I had been hoping would be the main report, with the big report as the appendix, but the commissioners felt it would detract from the words they had struggled with so long in the main report. The summary broke the study down into the seven themes summarizing the studies, making it more readable in a smaller book which you can hold in your hand instead of the five pounds of the main report.

At the hearing the report was not too well received. Scoop Jackson was flabbergasted, as was Frank Church, that the commission didn't recommend against interbasin transfers. They were shocked because they were sure, now that the commission had two more members from the Pacific Northwest, that it would oppose interbasin transfers. I should have mentioned the second change in the membership of the commission in which Clyde Ellis and Sam Baxter were dumped. Sam Baxter was a lifelong Republican from Philadelphia. He was replaced by Jim Murphy, who had been a Republican National Committee member from Montana. Clyde Ellis was replaced by Jim Ellis, who was the mastermind in Seattle Metro. This gave us two more Northwesterners

and so the balance that Lyndon Johnson has sought in his appointments was completely destroyed. This was another change cooked up in the White House without any consultation with anyone on the commission. I should say that none of the new commissioners suggested any change in the conduct of the study.

National Water Commission, October 1972. James Murphy, Howell Appling, Roger Ernst, Theodore Schad, Charles F. Luce, James Ellis, Ray Linsley, and Josiah Wheat.

Anyway, the commission didn't recommend against interbasin transfers, and the senators from the Pacific Northwest didn't like it. The commission recommended that if you need an interbasin transfer and it was economically justified, you should undertake it. But the commission did feel that you should make the basin of origin whole. In other words, you shouldn't just take their water, but you should recompense them, either with other projects or in some other way, to make them whole. This puts a double burden on an interbasin transfer, so you've really got to have a good project.

The commission was adamant in recommending that project beneficiaries should pay the economic costs of development, but always put in that you should give due consideration to the government's role in environmental protection. So it's not a rigidly economic report. Charlie Myers would have made it so. He was very rigid on economics, and he said, "If you want to have a scenic river, you've got to have some way to collect some money from the people that look at it." He was more rigid on reimbursement than our economists were.

Q: Let me ask you, before you go ahead with the reception to the report, I want to ask you one more question about the organization of the people who were involved. There were evidently panels that were established too. I presume these were advisory panels on various facets of water resources, everything from the economics of discounting to weather forecasting or whatever. What role did these panels have? Were they frankly cosmetic? Did they have substantive roles? What purpose did they serve?

A: I mentioned that earlier but I didn't call them panels. They were study committees set up to produce reports. Vic Koelzer set one up on planning and it was chaired by Harvey Banks. That's what you're referring to, isn't it?

Q: Okay.

A: And we had an environmental panel on which we had Bostwick Ketchum and George Woodwell from the Wood Hole Laboratory. It was a good environmental panel. We had a good pollution control panel headed by Dwight Metzler of Kansas. They were not just advisory because they were writing the background reports for publication. The environmental panel didn't do a major report, but it helped us to formulate a contract with Charlie Goldman out at Davis, who produced the big environmental report.

Q: Were the panelists paid or did they just donate their time?

A: I think they just donated their time, just like they would have for a National Academy of Sciences committee.

Q: Well, if I understand you correctly, then, your reports were generated three different ways: internally from your own staff, by contractors who were hired on contract, and finally through committees of experts. Is that right?

A: That's right.

Q: Okay, thank you, I just wanted to clarify that.

A: Well, it took a lot out of me and I was glad when it was over. I needed a rest. So I drafted a letter for Chuck Luce to send me on June 28th, telling me my services were no longer required because the reports were finished and they'd had the first hearing. This put me on the retirement rolls on June 29th, I didn't get any money for a long time, but I did get the benefit of what I believe was a percent increase effective July 1.

Q: You never considered going back to the Library of Congress?

A: No. For one thing I was at the executive level IV, and it would have been a step down. I didn't really want to go back, but if somebody had twisted my arm and said, "Ted, we really need you," I might have. I think I told you I've never gone out to apply for a job after the first time with the Corps of Engineers and taking civil service examinations to become a junior engineer. I guess I really didn't know how to get a job.

My wife told me that I should get a job in some completely different field to unwind. She thought I was beat from that last three months of 80-hour weeks. She could see what it had taken out of me, and I would have never been able to do it if it hadn't been for the support that she gave me.

One thing happened that I regret. When my elder daughter was a teenager, we had time to go camping and climbing together and I took her out West on mountain climbing trips several times. We did a lot of things together. But during this five years of the water commission, my second daughter became a teenager and we didn't have time to do as many things together. I never got to take her out West on a climbing trip. Of course, she did it all on her own and ended up as the chairman of the Explorer Scout Troop which did a lot of caving and climbing and bicycling. This is the co-ed upper level of the Boy Scouts. She did all that on her own. She didn't need me. But still I regret that

I was working too hard and didn't get to know her as well as I would have liked to.

There was one more hearing on the National Water Commission report in mid-July when the federal agencies testified. At the hearing on June 26th, just the commissioners had testified, and it was all sweetness and light except for what seemed to be amazement that they hadn't really come out foursquare against interbasin transfer. The hearing had been chaired by Frank Church who had been quite upset by earlier proposals to take water out of the upper Snake River to augment the flow of the Colorado River.

At the July hearing, representatives of the Water Resources Council and the federal agencies testified. My recollection is that they mostly hadn't had time enough to study the report, and the hearing concluded with the committee asking the Water Resources Council to respond to a series of questions.

The Water Resources Council was required by the National Water Commission Act to send comments on the report to the President and to the Congress. So many commissions had written reports which were sent to the President, and that's the last you ever hear of the report. There was a different provision governing this commission, which I had suggested to Wayne Aspinall when his committee was considering its authorization. That may have also been in the earlier bill introduced by a congressman from California, which I had worked on. The intent was to make sure that it got to the Congress. But it also required that the President comment on it and send his recommendations to the Congress. This was never done, and the report remains in limbo to this day.

Incidentally, we printed 9,000 copies and sent one to every congressional office. We also sent copies to the agencies downtown and to everybody that had been on any of our panels or had worked with us. I think we distributed about 2,000 copies that way. The Government Printing Office sold the other 7,000 copies and later reprinted it. When they were all gone, the plates were loaned to the Water Information Center on Long Island and they reprinted it.

One of the interesting things was that when we went to mail those copies out, at least five tons of reports, our local post office wouldn't take them; we had paid our postage bill for that fiscal year on the basis of the preceding fiscal year. So when all of a sudden we were dumping five tons of reports on a little neighborhood post office, they wouldn't take them. Bob Baker then found he

could take a bag of reports to each of six or eight different post offices every day so we could get the reports mailed. Just another example of how resourceful the staff was.

Q: You talked about how the Senate at least, and I presume that some people in the House too, reacted rather negatively to some of the recommendations. It strikes me that maybe '73, '74 were not particularly good years for commissions and studies. I'm referring to the fact that in '74, Congress, as I understand it, tells the Water Resources Council that it's not doing a particularly good job on principles and standards. I don't know whether you can shed any light on this or not, or if it at all relates to the National Water Commission Report, but as I mentioned earlier, in 1970 congressmen told the Water Resources Council to come up with principles and standards based on the four accounts, and then in 1974 Congress goes back and asked the Water Resources Council in Section 80(c) of that act to basically take a new look at the whole water resources field.

Was there a fair amount of disenchantment with the lack of emphasis in the executive branch on regional development, on social well being-on these kinds of things? Can you give me any background on any of this?

A: Well, I wouldn't put it that way. I think the real disenchantment was because the project reports weren't flowing up to Congress the way they used to, with an omnibus bill every two years. 1970 had been the last one, and there hadn't been enough reports to even think about an omnibus bill in '72. As I recall, the '74 act was really just basic authorizations and authorizing more studies. The lack of new projects, I think, is what was disenchanting Congress, and the agencies were saying that they couldn't get the reports out under the principles and standards.

Also, NEPA [National Environmental Policy Act] was in full effect by the time, which put an added burden on the agencies to do environmental impact statements, and there were lawsuits holding up projects. I think that's what disenchanted Congress. And I'm sure that agency people, in talking to Congress or talking to local interests, were saying, "We can't do this because of NEPA; we can't do that because of the principles and standards." In my opinion that's what disenchanted Congress.

I don't think it had anything to do with the National Water Commission report. In fact, I never got any real recognition about this report from the House side except that I got a very nice letter from Wayne Aspinall saying, in effect, "You did a great job." Actually, I got a couple of letters like that from members and staff people on the Hill who knew me. But they never had a hearing on the House side as far as I know.

But the staff read it and quoted it in committee reports on bills from time to time.

Q: I don't like to ignore the report, but I'm just trying to get things up-to-date here for a second. By this time, the Water Resources Council's talking about these two principal accounts, national economic development and environmental quality, and it has been argued to me by people who are still in government that Congress was not happy with that emphasis, that continued emphasis on those two areas, and that there were people in Congress who felt very strongly that there had to be much more of a regional focus in water resources and also more emphasis on this social enhancement value. Some of this was in the Appalachian Region project in 1960s. Do you have any response to that?

Environmental Studies Board, National Academy of Sciences

A: No, because I was no longer involved with the Congress. After I left the commission, I went to the National Academy of Sciences working as executive secretary of the Environmental Studies Board, of which Gilbert White was the chairman at that time. Later, I became deputy executive director of the Commission on Natural Resources of which he had become chairman. So my orientation at that time was completely different. We were not strictly geared to the Congress so much, but more to federal agencies that ask you to make studies. The project for which the academy had hired me was to provide assistance to the Rockefeller Commission. The name of it was the National Commission on Water Quality. It was set up by the Water Pollution Control Act amendments of 1972.

That was my first principal substantive staff project at the National Academy of Sciences, but then I also was given administrative responsibility for a major study financed by EPA on the use of scientific and technical information in environmental decisionmaking. This was a big project, another $5 million

project that was spread around through other parts of the academy. I became so engulfed in the administrative work that I wasn't able to do much substantive work.

It was my job to keep those studies going, plus a lot of other different studies that were under way, and also to raise money for new studies. I guess that's why I wasn't able to keep up with what the water resources agencies and the Congress were doing. I did get involved in the Potomac River studies for the Corps. This was the study of the potential reuse of the Potomac estuary for water supply through development of a water purification plant at Blue Plains. The other part of that was an overall study of the water resources requirements of the Washington metropolitan area.

I had worked out the legislative authorization for that study with Senator Charles Mathias's staff. It was needed because Sixes Bridge and Verona Dams were authorized in the '74 act, but before you could move into construction, you had to do these other studies to show that they were the only way to get water for the Washington metropolitan area. I was at the academy when that came up and we drafted some language to permit the Corps to ask the National Academy of Sciences and the National Academy of Engineering to make the studies. I was involved in getting the legislation, but when it came before the Environmental Studies Board for approval, they turned it down because the board felt that it was not an appropriate study for the academy. Most of our studies were of a more generic nature. Another part of the National Research Council, the Assembly of Engineering, agreed to do it and eventually it led to the creation of the Water Sciences and Technology Board to do studies like that.

So I was working on all kinds of things like that, and I wasn't really following water policy in the way that I had for years, except, of course, water pollution control policy, which was the purpose of the work for the Rockefeller Commission.

Q: Did you get involved in restudying the Corps' original Potomac report-the famous 16-Reservoir report that ran into a road block.

A: No. I did not, but that's where they got the proposal for Verona and Sixes Bridge.

Q: You also were a consultant for the Conservation Foundation at the same time, were you not?

A: No, that came later. But first let me tell you how I got to the National Academy of Sciences. This was another one of these things that just happened to me. It was all due to Dick Carpenter, who had been one of the people with whom I had been involved in bringing into the Library of Congress as one of our senior specialists in science. Before he came to the Library of Congress, he had not been in the government at all. He had been working as a chemist with the Callery Chemical Company, or Gulf Oil, or somewhere in industry. He was called to my attention by Carter Bradley, who was on Senator Mike Monroney's staff, who told me that he had met a young man from Oklahoma who wanted to work in the policy area. And that was my introduction to Dick Carpenter. We didn't usually consider hiring anyone recommended by a member of Congress, but I agreed to let our search committee interview him. We were staffing our Science Policy Division and the committee interviewed him. He was the best candidate so they recommended him. So we did hire him as one of our senior specialists in the scientific policy area.

That reminds me of another example of where I goofed in 1967 or early 1968. Bill Van Ness from Senator Jackson's committee came to me and said, "We're thinking about introducing legislation to require an environmental analysis of projects before they can be recommended." Bill Van Ness was staff director of the Senate Interior Committee. He showed me their draft bill and told me he'd been working with Lawrence Rockefeller and other prominent people in the environmental movement and asked for my help.

I looked at what he was proposing and concluded that it would slow down the authorization of water projects and that the Congress would never enact it. So I think I said something like, "The Congress is never going to pass legislation like this because it'll essentially bring the water resources program to a halt." So I didn't agree to work on it with Bill Van Ness but turned the assignment over to Dick Carpenter, thinking that it wasn't important enough for me to take on. I was still the senior specialist in engineering and of public works but I was also the deputy director of the Legislative Reference Service. I just didn't think that legislation was going to fly.

But Dick Carpenter took on the assignment, working with Bill Van Ness and others. They set up a colloquium which made a good record in favor of the

legislation. By that time we had another more junior young man on our staff whom we had hired away from the United Nations Development Program in New York. This was Wally Bowman. He and Dick Carpenter worked with the congressional committees on both sides providing the kind of assistance that the Legislative Reference Service used to provide routinely before the exponential proliferation of congressional staff following the enactment of the Legislative Reorganization Act in 1970. So Dick and Wally had important roles in the enactment of NEPA which I think was signed about the first day of 1970. By that time I was over at the National Water Commission.

Q: Did you ever meet Keith Caldwell?

A: Yes. Keith Caldwell was one of the people who considers himself to be the prime mover in getting that law through. Keith was a friend of Dick Carpenter's and Wally Bowman's and was involved with them in the early stages, maybe before they got involved. Keith later became one of my good friends. He was a member of the Environmental Studies Board, but before that I think he did some work for the National Water Commission.

Anyway, my judgment was that the NEPA bill was not going to go anywhere, and I was so completely wrong that I probably shouldn't even mention it. But Dick Carpenter did a great job in connection with the NEPA authorization, and that may well be why he was selected by the National Academy of Sciences to direct the Environmental Studies Board. So that gets me back to how I got to the National Academy of Sciences.

In early July I was cleaning out my desk at the National Water Commission office when I got a call from Dick Carpenter. He was at the point of trying to get a study for the National Commission on Water Quality organized, and he wanted my suggestions for the names of people who might be willing to serve on the academy's committee.

Rockefeller and the other members of the commission had been appointed, and I believe Ron Linton had prepared a prospectus for accomplishing the commission's work. Fred Clarke, who had just retired as Chief of Engineers, had been appointed as executive director of the commission and Joe Moore was the study director. They had just started to dicker with the academy for the establishment of a study committee to provide consultation services to the commission. Dick Carpenter had not had much experience in the water

pollution field. He was a chemist and had been more involved in environmental policy, which had led to his appointment as executive secretary to the Environmental Studies Board. He had just been made executive director of the new Commission on Natural Resources, which at that time encompassed the Environmental Studies Board, Agriculture Board, Oceans Board, Radioactive Waste Board, and Minerals and Energy Board covering the whole, broad, natural resources area. So he was swamped with work.

When he called me up to ask for my help in finding people to work on this study for the Rockefeller Commission, I gave him some names of people who I thought would be competent to serve on the committee. At the end of the conversation Dick said, "How's everything with you?" And I told him that my work with the National Water Commission was finished, that I had applied for federal retirement, and that I was going to do consulting work. Actually, I already had a few academic things lined up, such as giving a short course out at Berkeley and some lectures at the University of North Carolina and a few speeches. But I hadn't given my future much thought because I needed to rest for a while after the intensive work to close out the commission. I also had a mountain climbing trip to the Mount Robson area in British Columbia scheduled for the latter part of July. And there was still one more hearing, the hearing with the government agencies on the National Water Commission report scheduled for July 17th. A few days after that I was planning to leave for Mount Robson.

So when Dick asked me if I would come to the National Academy of Sciences to handle the water quality study, I responded negatively. I told him I was too weary to take on that kind of a job. Dick persisted and said he would talk to me again when I got back from the climbing trip.

It was a great outing with a group from the mountaineering club at the State University of Iowa. But after a lapse of several years during which I hadn't done much climbing, the mountains seemed to have gotten a lot higher than when I was in my 30s and 40s and doing a lot of climbing. We were camped at about 6,000 feet at the northeast side of Mount Robson. We had to walk in about 16 miles to get there, the peak went up to over 12,500 and was full of glaciers on that side. To climb Robson, the easiest way you had to kind of circle around the mountain to ascend the peak from the south and it was a two-day trip. All of the other peaks in the vicinity were about 10,500 feet or more,

which made for a long day. At least for me, 4,500 to 5,000 feet is a long climb.

I made a few climbs and was getting relaxed, when one day near the end of the trip-it was a two-week trip-1 slipped on the way down from a peak. I was off of the climb, off of the snow and rock and steep part of the climb, walking down the trail, but I slipped and almost fell, twisting my knee and, in recovering, twisting my back. The next morning I was practically a cripple, 16 miles from the road. There were two doctors on the trip. They put on hot compresses and gave me some pain killers, and after I rested for a few days I could walk with some difficulty. The doctors had a big debate. One doctor thought I ought to get a horse to ride the 16 miles down the trail, and the other doctor said it was the worst thing you can do if your back is bad.

I had to make the decision and I compromised. I rented a horse but I started walking early in the morning so I could get across the streams before the snow started to melt. And I got down off the really steep part of the trail, which would have been brutal riding on a horse, and I walked about 12 miles before the pack train caught up to me with the horse that I had engaged. So I rode the last four miles. Then I rode down to Banff in the back seat of a Chevrolet Monte Carlo coupe all crammed up with luggage. When I got to Banff, I could hardly walk, and when I got home after sitting on an airplane, which is never good for a tall person, I was really a cripple. I was making phone calls to get work lined up and rarely ever got through on the first try and I didn't have a secretary and Dick wanted to talk to me again.

So that's how I came to work at the National Academy of Sciences. Dick made me an appointment to meet with John Coleman, who was executive officer of the National Research Council at that time. John Coleman had tried to hire me for doing the academy's study for President Kennedy back in 1961, but I couldn't go over there because I had been away from the Library for so long working on the Senate Select Committee staff. I had been on some other academy committees so John knew me, and for him it was just a question of when could I start work. I was barely able to hobble around, but I started work about the middle of August. And then it turned out that in addition to running the water quality study, I had to be the executive secretary of the Environmental Studies Board for Dick to find enough money to pay my salary. So I ended up with a lot of other administrative responsibilities for things I didn't know much about.

We had air quality studies, including one for the Senate Public Works Committee. This was an antecedent to the Air Pollution Control Act. That study was underway when I came on board in 1973. We did it for Senator Muskie and I remember that Leon Billings, his staff aide, was furious when the academy hired me because he held me responsible for what the National Water Commission had said in its report which rejected the technological fix of the '72 Water Pollution Control Act and the zero discharge goal. The committee had just recommended continuing a water quality based approach, with a polluter pay philosophy.

Commission on Natural Resources

I went to work at the National Academy of Sciences on a two-year assignment and I ended up staying there 10 years. I had a great deal of interesting work, not so much in the water resources field, although a lot was related to water. I was in charge of the study on federal water resources research which we completed just before the Reagan administration decided to abolish the agency that had recommended it.

I was working with a lot of the same people I had worked with over the years. Gilbert White was chairman of the Environmental Studies Board and then became chairman of the Commission on Natural Resources. I was deputy executive director to Dick Carpenter when he went off to teach at Dartmouth for a semester and I had handled his work whenever he was away. So when he resigned to take another position, I became acting executive director of the Commission on Natural Resources for about a year and staffed the selection committee that was appointed to find a new executive director. It took about nine months or so before we ended up hiring Wally Bowman with whom I had been associated at the Library of Congress.

I was involved to a certain extent on the selection committee, but I didn't make the decision to hire him. That decision was made by Phil Handler. I remained as deputy executive director. I enjoyed the privilege of working as deputy to Dick and Wally, two people who had formerly worked under my supervision. We got along fine together and there was a great deal of mutual respect. I was delighted to have them take the primary responsibility, but I was in a position to fill in for them whenever it was necessary. We did a lot of good work together.

Q: Tell me about this study that you say Jamie Whitten requested on science and technology and the impact on water resources or something of that sort? Can you tell me? That sounds like an interesting one to me.

A: Yes, it was very interesting. Jamie Whitten wrote it into the appropriations act for EPA, $5 million. EPA was directed to contract with the National Academy of Sciences for a study of how scientific and technical information is used in environmental decisionmaking. While he was at the Legislative Reference Service, I think Dick Carpenter had been requested to help Jamie Whitten develop material for his book called *That We May Live.* This was a stirring defense of the use of pesticides to keep up agricultural production. Knowing that Dick would be in charge may be what led Congressman Whitten to request that the study be done. I don't know whether he came to Dick to get help with the wording of the legislation for the study, but usually the members would consult with us before they would write legislation. We had to tell them that the Congress could not direct the academy to do a study because the academy is not a government agency. It's an independent corporation, not for profit, created in 1863 and chartered by the Congress.

Anyway, the request was directed to us and Dick and I developed a very good rationale for the study. We proposed about a ten-study program, including generic studies in areas like research, decisionmaking, and manpower, and a number of specific study areas like noise pollution and sludge management. There were several others that I don't remember. All of these studies would be done by committees under general control of the Commission on Natural Resources through a master steering committee which would be directing the whole study and would put together the final summary report.

At that time, $5 million would pay for a big study. It was probably about 10 percent of the National Academy of Sciences' annual budget. Although it was not a one-year study, it was a big study and the Commission on Natural Resources was brand new. It had just been set up for a short time. This was Phil Handler's reorganization of the National Research Council as the operating body of the National Academies. It was divided into four commissions and four assemblies-assemblies being disciplinary oriented and commissions being multidisciplinary.

There were some clashes obviously because you can't divide the scientific world up that way. So Phil Handler, even though he had a great deal of faith

in Dick Carpenter, decided that he didn't want to let this new little commission, which had a total budget of only about $5 million, take on the whole $5 million study for the whole academy which cut across the interests of other units. We argued against the decision but we lost, and a decision was made to have an overall committee with one representative from each of the eight commissions and assemblies-or maybe just seven of them, because one of them was international.

The first thing they did was throw out our rationale, which I believe was a rational basis for the study, and let each group propose a study. Just by coincidence it happened that there was one study for each of the commissions and assemblies that was involved. It's somewhat like what happens when you write an omnibus bill with a number of members on the committee and just by chance you happen to have a project in each member's district. So that's the way that study was done.

We lost control of the overall study, but the Commission on Natural Resources and the Environmental Studies Board did have the major role because we had the overall decisionmaking study, which put it all together, and we had the research study. It was a very interesting study. At the beginning I kept meticulous files on how it was being done, which soon filled several file drawers. The amount of paper you can generate with $5 million is just unbelievable!

Q: Was there one specifically on water quality?

A: No. But there should have been. By that time we had a contract with the Rockefeller Commission and Joe Moore, the study director, was enraged when he found we were talking about the possibility of including a study of water quality. The executive director of the Rockefeller Commission, Fred Clarke, who was a member of the National Academy of Engineering, didn't think there would be any problem, but Joe Moore thought it would be a conflict of interest. He even objected to our having a study dealing with municipal sludge management because he felt that the National Commission on Water Quality should be the only entity working on any aspect of water pollution control. So we didn't include a study on water, but we did have the one on municipal sludge management. It was chaired by Harvey Banks, one of three studies that stayed in the Environmental Studies Board.

The Whitten studies led to what might be characterized as a dogfight within the National Research Council representing the bones that the dogs were fighting over. In the end, the money was pretty well spread through the organization. Having a committee representing organizations instead of disciplines is not the way the academy usually does things, so I'm not really too proud of how that $5 million was spent. However, there were some good reports made; a series of 10 reports were published. Whether it made Jamie Whitten happy or not, I don't know. A man like Jamie Whitten probably never paid much attention to them.

Q: Why don't you continue with what you did after you left the National Academy of Sciences. When did you join the Conservation Foundation? Was it when you were still with the academy?

A: No, but let me continue with what #happened as they reorganized. When Frank Press, who had been a member of the Commission on Natural Resources before he became President Jimmy Carter's science adviser, was elected to the presidency of the National Academy of Sciences in 1981 which made him chairman of the National Research Council, the work was slowing down. There had been a lot fewer contracts during the Carter administration because we were perceived as being partial to industry. I remember one official of the EPA telling me, "I'm not going to piss away any more money on the National Academy of Sciences."

I had been quite busy with a study on water resources research, of which Bill Ackermann from Illinois was the chairman. It was an analysis of the Office of Water Resources Research's proposed five-year plan, which they drew up toward the end of 1980. We got our report out in January 1981, but nobody was interested. They never even put it on the shelves with other unread reports because that's when the Reagan administration decided to abolish the Office of Water Resources Research. There weren't going to be any shelves!

There didn't seem to be any influx of studies coming in from the Reagan administration, probably because, by that time, we were perceived as being partial to environmentalists.

Anyway Frank Press decided to reorganize the National Research Council staff. For the lower work load, the administrative structure may have been considered top heavy. The work of the Commission on Natural Resources had dwindled

from about $5 million a year down to about $3 to $3.5 million a year, which hardly justified having a separate commission. So he decided to combine natural resources with mathematics and physical sciences into the Commission on Physical Sciences, Mathematics, and Resources. In essence, Wally Bowman's job and my job were abolished.

They wrote Wally Bowman a letter saying that his job was abolished and gave him a pretty nice golden handshake as they said good-bye. They even paid the fee to an outfit that tried to help him get another job. But Wally didn't need that kind of help. He helped Gus Speth write a proposal to the MacArthur Foundation, and when it was funded, he became the administrative assistant director of the World Resources Institute.

Wally, of course, was well known by everybody in the environmental field because he had been the executive director of the Conservation Foundation and had been involved with the NEPA authorization when he was at the Library of Congress, so he was a big help to Gus Speth. The first grant was $14 or $16 million from the MacArthur Foundation, and Gus raised a lot more money.

I never got any official notification that my job was terminated. I stayed on the payroll and nobody ever told me that my title was changed. But later, in what I thought was an unusual way, in a memo to the whole staff, Frank Press announced that I was going to be involved in organizing the water resources activities for the new commission.

Commission on Physical Sciences, Mathematics, and Resources

Q: Excuse me, which new commission?

A: The new commission was the Commission on Physical Sciences, Mathematics, and Resources, CPSMR. They changed the whole organization around and eliminated some of the jobs, and I was given an allocation of funds to try to develop a board on water science. In the meantime, the Potomac River studies for the Corps of Engineers were nearing completion in the Water Technology Board of the new Commission on Engineering and Technical Systems, CETS, and they decided they were going to create a board on water technology.

Earlier, I think I told you, the reason that we hadn't done this study in the Environmental Studies Board was that the study of the water purification plant and of the Washington water supply was considered to be technology, so it was taken over by the Assembly of Engineering. So we started down the road toward having two boards, which didn't make much sense to me. But it soon turned into a bureaucratic struggle. Bob White had become chairman of the CPSMR, and Guy Stever was the chairman of CETS. Neither one would give an inch, and I just couldn't get them to agree on one board. Then letters started coming in from people like Gilbert White and Tom Malone telling Frank Press that there was no way to separate water science from water technology. Finally, enough people complained about the idea of splitting water technology from water science that Frank and his executive officer, Phil Smith, agreed that we would have one board and it would report to both commissions.

I stayed on for another year or so as the CPSMR member of the Water Sciences and Technology Board staff. We called it the WSTB, instead of the Water Resources Board so we could call it "WASHTUB." I stayed on, working three days a week because there wasn't enough work to keep me busy more than that, until I was 65 years old. I guess I felt as if I'd been kicked upstairs, but I didn't really want to take on any new responsibilities.

Also, I had bought a sailboat a year earlier and had gotten a Coast Guard captain's license so I could take paying passengers. My return to sailing really went back to my memories of the 1973 trip to Mount Robson when my legs had given out and a trip to Switzerland in 1977 with the Seattle Mountaineers on which I had not been able to climb any of the high peaks because of the deep snow. I do love to get to the top of high mountains. Life is so simple when you get to the top of a mountain; there's only one thing to do and that's to go down. And it's so easy to make that decision.

So I had decided to return to my teenage passion for sailing which I started in a big way by buying two boats for chartering. This was facilitated by the Reagan tax philosophy which permitted use of the accelerated cost recovery system, so that it was financially advantageous to buy a boat rather than to keep on chartering. It worked out so well for the first boat that I bought a second boat and decided that sail boat chartering would be my new career. That's why I'd gotten my Coast Guard captain's license so I could make it a business and spend a lot more time sailing.

One of the first major trips was when I sailed a group up to a meeting of the WSTB at Woods Hole. There were four of us who were going, we were all good sailors, so we sailed the boat up to Woods Hole, which is an ocean passage. In the fall of 1983 I planned to take one boat down south to charter it out of Fort Lauderdale so this was another rationale for retiring from the academy.

I also hoped to spend more time doing things with my wife who always wanted me to just stop work because with the possibility of an annuity from the academy and the federal annuity, I didn't really have to work for pay. She also thought it was great for me to get some relaxation on the sailboat, although she was never interested in sailing.

Q: Where do you keep your boats?

A: Both of them are now chartered out of Annapolis. When I took that boat south in 1983, I chartered it through a broker in Fort Lauderdale. We had already booked one charter for $3,600 for four weeks. That was a very nice fee, even after the charter agency took 35 percent. So I thought it would pay to take it down south. But the competition was very stiff and we only had a couple other charters, so I didn't take the boat down anymore.

But it was fun taking the boat south in the fall and bringing it back in the spring via the Bahamas. I also took one charter party to Key West. We had planned to go to Fort Jefferson in the Dry Tortugas, but there wasn't enough time.

National Groundwater Policy Forum, Conservation Foundation

While I was on the ocean in the spring of 1984 bringing the boat back from the Bahamas, my wife started to get calls from Governor [Bruce] Babbitt who had agreed to chair a groundwater policy forum for the Conservation Foundation. And that's when I got involved with the Conservation Foundation. Babbitt never could understand why my wife couldn't get in touch with me. But I finally got his message and got in touch him, and he asked me if I would be the executive director for the National Groundwater Policy Forum. After I read a lot of material and talked to Bill Reilly, I agreed. Bill Reilly had been on the Commission on Natural Resources and I knew it would be a pleasure to work with him. I also knew Toby Clark, who had been at EPA before he came to

work at the Conservation Foundation, and I knew I would enjoy working with him.

It turned out to be a lot of fun, and in a way I was glad to be back at work on a policy study. I was only supposed to work three days a week, but I ended up working a lot more. The commission met only a half a dozen times; we had three field hearings and frequent staff meetings. I think we did a lot of good work in evolving a policy which would take the primary responsibility for groundwater out of federal hands and give the primary responsibility to the states with action to be taken by local governments and the private sector.

Governor Babbitt was a good chairman, but he didn't always follow the script we prepared for him. We proposed a lo-point program under which each state would have a program for managing its groundwater, starting with mapping of aquifers, setting ambient standards, and coordinating groundwater with surface water.

Conjunctive management is what it is called, but we also stressed managing groundwater with other natural resources, a much broader concept. One of the big fallacies in resource management is that we've never really had an overall look at resources. This was one of the places where the Conservation Foundation has taken a leadership role: multimedia environmental management. This was where the Congress has been led astray because the federal agencies have never coordinated programs for water pollution control, air pollution control, and solid waste management. Sometimes the programs are in the same committee and sometimes they aren't.

The Conservation Foundation has done work trying to remedy that situation. The modus operandi has changed from when they were funding Leopold and [Thomas] Maddock and Hoyt and [Walter] Langbein to do studies. Now they are doing most of the studies with their own small staffs, financed with grants.

The groundwater policy study took a little bit longer than we expected. It was supposed to be about an 18-month study, but it was almost two years before we completely finished. We had put out the draft report and gotten back comments and were revising the draft when I got a call from Ronco Consulting Corporation, which had a contract with the USAID [United States Agency for International Development] for help on the Gambia River basin. The USAID

project was to advise an institution called, in English, the Gambia River Basin Development Commission.

It was an international organization comprising the countries of Senegal, The Gambia, Guinea, and Guinea Bissau. The four countries had organized the commission by an international treaty. It didn't have much money, but they had hopes of building some big dams, on the Gambia River which was their idea of how to solve their water problems. The Gambia River is one of these streams that's a roaring torrent in the wet season and a dried-up river bed in the dry season. The idea was that you'd build some dams and store the water in the wet season so that you'd be able to irrigate all through the year.

USAID had commissioned an immense study which had been done by the Center for Research on Economic Development at the University of Michigan. There was a series of five reports which stressed the environmental problems of these dams which were severe. They also had a lot of mapping done and were trying to wrap the whole thing up into a report which would help the OMVG (the French name of *Organization de Mise et Valeur de la Fleuve Gambia)* achieve its objectives. Ronco wanted me to go to Dakar as an expert on river basin planning, to try to reorient the plan into a more environmentally sound solution to the problems. I don't remember who had given them my name. It may have been Henry Caulfield. It sounded as if it would be an interesting assignment, and I thought I could do some good. It would require going to Dakar, traveling in the Gambia River basin, and then writing a report on how they should wind up this project to led to a more realistic development plan.

By that time we had almost run out of money at the Conservation Foundation for the groundwater study. It was funded by the Ford Foundation and the Joyce Foundation and several others. I never liked the business of going to foundations for money. To me it seemed like a conflict of interest to ask for money, part of which was going to be used to pay my own salary. The report was completed to the stage of refereeing the haggling over words between David Roderick, the chairman of U.S. Steel, Jay Hair, of the National Wildlife Federation, and the governors, Governor Babbitt, Governor [Thomas] Kean of New Jersey, and Governor [Anthony Scully] Earl of Wisconsin. There were about 15 members and they worked well together, but they were arguing over the final words of the recommendations. So it looked like there were greener pastures for me in Africa.

The Conservation Foundation was willing for me to go. Toby Clark had been very much involved in getting the groundwater policy study going before I came on board, and he took charge of completing the report, which was called "Groundwater, Saving the Unseen Resource." In the meantime, several other groundwater studies were made which tended to vitiate the Conservation Foundation report. The National Water and Power Alliance was making a study as was the Northeast-Midwest Study Conference, and the National Academy of Sciences was beginning work on a groundwater study using some of the same members that we had as staff representatives.

Senator [Dave] Durenberger later introduced legislation to implement the recommendations of the Conservation Foundation report, and there was a companion bill in the House, but they foundered on the rock of bureaucracy. The federal agencies involved in the federal research and monitoring efforts testified at hearings, but there was no agreement on a division of responsibilities, so the bill was never reported out of committee, to the best of my knowledge.

River Basin Planning, Dakar

So in 1986 I went over to Dakar for two or three weeks in the field, then came back to Washington to complete a report on a plan which should have led to a basin plan oriented much more toward development of groundwater rather than building big dams, some of which have turned into disaster areas in Africa.

The original plan that had been proposed by French and British engineering firms contemplated a large dam in each country except Guinea Bissau, with a number of smaller dams in the headwaters. It was somewhat like the Corps of Engineers' original plan for the Potomac River, which foundered because one of the dams would have flooded some of the Byrd family's apple orchards. And this was to help people that are barely into the 20th century. A lot of them are not living in the 20th century yet; they're living in mud huts with dirt floors and thatched roofs, and they're not ready for Western style irrigation. To make the irrigation pay, you would have to double crop and farm very intensively. The dam in the Gambia would have been a tidal barrier that would flood out and destroy the tidal irrigation on the Gambia River plain. This is rice irrigation in the upper reaches of the estuary where you still have fresh water half the year.

Anyway, I outlined a planning technique, possibly based too much on the way we do it in the United States, but which would get the local people involved in deciding how to go about developing their resources. They're not dumb people, but they're not academic people, and they don't do a lot of writing. Many of them don't speak French or English, but have their own language. But from what I'm told, they're quite intelligent and they do a good job of managing the resources they have. So I wrote a report with a schedule of public meetings throughout the basin and a plan for developing a number of small projects, mostly from groundwater. Essentially it would have the OMVG staff, with the assistance of USAID, do the same thing we would do if we were making a basin study in this country, only geared to those people and finding out what they wanted and what they were ready, willing, and able to do.

I found that there are many water resource developments in Africa including some in The Gambia, that have been built with Western money, and even though they did a good job building them, they fall into disrepair when the Westerners go home because the local people don't keep them up.

The USAID contract was to end in December 1987, and I went back to the Gambia River basin and to Dakar again in the fall of that year to complete the final report only to find that the OMVG staff hadn't done anything that I recommended, but were still trying to get money to build the big dams. I thought the program I had worked out was realistic, but the politicians running OMVG think in terms of building big dams. We've had the same problem in this country. We used to have a hard time getting full consideration of the social and environmental impacts of projects.

When you build a dam, you've got something you can see and sometimes a pretty lake-if you like lakes rather than flowing rivers-and you can put a plaque on the dam with a politician's name on it. Sometimes you can even put the name of the engineers who designed the dam, but particularly the local politicians love to dedicate dams. I don't know what's going to happen with the Gambia River, but it's in an area where the population is increasing faster than their resources are being developed. If the current increase of about 3 percent a year continues, the population is going to double in about 24 years. So I guess the six months I spent on that project were wasted, but it was a good experience for me.

After I finished the report on the Gambia River basin, I worked with a firm named Apogee Research on various projects for the Corps of Engineers and EPA. I got involved with Apogee Research primarily through working for the National Council of Public Works Improvement. I worked on a couple of their projects, one of which was with Apogee.

But my wife had developed a brain tumor in 1985, and after it was removed, I was spending a lot more time with her. We traveled as much as she was able to in 1986, but the tumor continued to grow, and she is now terminally ill. It's a question of time, and she is losing her ability to function, which is very depressing for me.

Family Life

Q: Let's talk just for a few minutes if you will about the personal side of your life. We've been talking about your professional career all this time.

I'd like you to talk about your wife a little bit, as you please, and also mention your children and what they're doing and so forth.

A: I guess I probably married the only person in the world that would put up with me. And this, interestingly enough, goes back to my love of maps. She loved maps too, and was a map collector. That's how I got to know her. We corresponded for years before we even lived in the same city. It was a very voluminous correspondence for almost five years which led to our falling in love. We were married in 1944. She's a very wonderful person. I guess everybody says this about their wife. At least I thought she was a very wonderful person, a very warm and friendly person. She was the librarian at Judson College in Marion, Alabama. She got her library degree at Louisiana State University, and then she worked in Seattle for the University of Washington Library after I persuaded her to come out to Seattle when I lived there. We had a lot in common, particularly our love of music and the theater and literature and people.

When we lived in Seattle she began climbing some of the minor peaks with me. She used to love climbing in the spring and early summer when you could slide down or glissade on the snow. Sometimes you can do a sitting glissade, sitting on a poncho and descending sometimes thousands of feet. It is really great fun

and it's a lot easier than walking down. So she enjoyed the mountains, but not so much the cliff climbing. When I came back to Washington and took up cliff climbing, or rock climbing as we called it, along the Potomac Gorge, she went out a few times and demonstrated that she could do it, but she had gotten a job as a children's librarian in the District of Columbia Public Library and so she gave up climbing. She never took up caving when I did. Caving came to me naturally because the climbers were exploring some of the difficult caves which required the use of climbing techniques. It was a lot cooler in the summer climbing underground than in the open, and that's what got me started.

My life was very much organized to keep some quality of life by spending as much time as I could in the outdoors. We did a lot of camping on weekends and on summer vacations in New England and eastern Canada. Kay eventually went to work for the Navy Department Library. She was working there when our first child was born, and she loved it so much that she really intended to go back to work.

Q: When was your first child born?

A: In 1955.

Q: What was her name?

A; Her name is Mary Jane. We fully expected her to be a boy because she was large and active in the womb. We were going to name her Clifford William after a very good friend and my father's. The doctor was positive she was going to be a boy because Kay is small, 5 feet 2 inches tall and her normal weight is about 105, and the doctor said, "You're going to have a boy. I can tell by the vigorous way that he is kicking." On the way to the hospital Kay says, "Maybe it will be a girl. What will we call it?" And I said, "Well, I don't know, how about Mary Ann or Mary Jane, just a good old-fashioned name," and then I said, "No, I wouldn't want to call her Mary Ann because we had a cow named Mary Ann on the farm." (Laughter)

So Mary Jane it is. And Mary Jane is just as wonderful as her mother. I guess everybody feels that their children are wonderful and she certainly is.

Q: What does she do now?

A: She started out to be a forester, because she loved those mountain trips in the West and we always had the forest rangers come in and talk. These were big trips with the Colorado Mountain Club or Sierra Club, so she started out at Westhampton College in Richmond, part of the University of Richmond, with the intention of going two years there, followed by three years at Duke in forestry.

Her first summer job, which she got herself, after we told her she would never get a summer job with the Forest Service because there's too much competition, was as a junior forestry aide out in the Six Rivers National Forest in northern California, headquartered at Gasquet near Crescent City. You should know about Crescent City because the Corps built a breakwater there using tetrapods.

She worked there one summer after her freshman year, and when she came home in the fall she decided that that was not what she wanted to do with her life. First, she got a lot of poison ivy even though she'd had shots. She was out there working with tree planting contractors, mostly Mexicans, and if you didn't watch them closely, they would put the little trees in upside-down and they didn't give a damn. They did not like being supervised by a girl. Also, she didn't like working by herself even though she had a wonderful time while she was there. So she decided to change her major to American Studies thinking in terms of working in museums or something like that.

That led her to get a job at HABS [Historic American Buildings Survey] the next summer, after her sophomore year. I never had to help her get a job. She always got her own jobs. She had worked after her high school graduation too, as a secretary at HABS, that's how she started. For her junior and senior years she transferred to the University of Delaware where they have all those museums, the Hagley Museum and Winterthur and others. Delaware had a good course in American Studies partly because of those museums.

This led her into the historic preservation field when she graduated in 1977. She graduated in three and a half years and was a valedictorian. She had a straight 4.0 average, both in high school and in college. She could have gone back to finish out her 4th year with some advanced work and graduated summa cum laude. But she decided to go to work, and she's at the same firm, Oehrlein and Associates, ever since she graduated. They do a lot of historic preservation work. Among their recent work is the repair of the Tomb of the Unknown

Soldiers at Arlington Cemetery. The Corps built that, and it has developed cracks that have to be repaired, so the Corps does have some problems with its construction.

Q: The Corps didn't make the cracks.

A: No, but the Corps designed and built the project, and it's apparently settled causing cracks.

Q: What about your other daughter?

A: The other daughter was born three years later. After Mary Jane was born, Kay didn't go back to work as she had planned. She decided it was more fun to play with the little baby. But after a year or so she went back to work part-time establishing a library for the American Automobile Association (AAA). When our second daughter, Rebecca Christina, was born in1958, Kay stayed home full-time because by that time we felt that Mary Jane really needed her to be home. Mary Jane was in preschool by that time so Kay gave up her library work and she gave up her writing. Kay also had done some writing. She wrote a book about her mother's childhood. It was written as a children's book. Her mother grew up in Alabama in the 1890s, and when our babies came along, Kay took on the job of raising them as her primary responsibility. She loved being a mother, and I think one reason both daughters turned out so well is that they have a wonderful mother.

Q: What is your second daughter doing?

A: She takes after her father; she loves the outdoors. She went to Warren Wilson College near Asheville, North Carolina, and majored in biology. She spent one semester with the Ocean Research and Education Society, which was two months on a ship doing research on whales and cetaceans in Baja, California. She loved that and she really wanted to go on and do a master's degree in that field at the University of California at Santa Cruz. But when the time came, she also felt she'd had enough school, just as I had when I graduated from Johns Hopkins.

She had done a lot of volunteer work at the Smithsonian when she was in high school, which led her to a job doing research on bats at Barro Colorado Island in the Gatun Lake in the Panama Canal Zone. Barro Colorado Island is an

isolated ecosystem staying the way it was when the Gatun Lake was filled when the Panama Canal was built. There are many different species of bats, mostly fruit bats, living on the island. She worked there for the better part of a year, helping with a research project which has gone on for some years under the direction of the curator of mammals at the Smithsonian. She loved that work. And the job fit her perfectly because she is a night person. They started work at 4, 00 P.M., went out and collected some bats with nets and analyzed them, recording species, size, what they had been eating. I think she even identified a new species. She is an expert on bats.

At the end of a year, she came back and worked at the Animal Welfare League of Arlington. It was very difficult for her because she had to make decisions as to which animals to put down-unwanted dogs and cats-and this hurt her. So when she got a chance to go back to the Barro Colorado Island, she did. She left the animal shelter and went back to the Canal Zone for the Smithsonian for another year.

Since then she has her own business under the name Wildlife Matters. She helps people, homeowners and condominium livers, cope with bats, raccoons, possums, and any of the other wild animals that sometime disrupt suburban life. She puts caps on chimneys to keep out raccoons and all kinds of things like that. It's a small business and she is the sole proprietor, which made it possible for her to take six weeks to go back to Panama to help the Smithsonian with an inventory of the biota on two little islands on the Caribbean side of the upper end of the country of Panama. That's where she is now.

Q: Are either of your daughters married?

A: The elder daughter is married and no children. She was married to a young man and the marriage broke up after nine years, and now she's married again, just since September. Anyway, they've been supportive.

Now going back to my wife, Kay, four years ago she was diagnosed as having a brain tumor. It was operated on and it became obvious that it had developed over a long period of years because it was calcified. Her doctors thought she would be all right, that the cancer was eliminated by the removal of the tumor, and that they didn't even need to do radiation. They probably should have done the radiation because the tumor came back. She had the radiation which kept it under control for a while, and we've had several good years. But eventually

she started to lose her motor control, was losing her ability to walk, and she was losing memory of very common ordinary things. She had another operation 14 months ago to remove the cyst which had developed, but it was in a different form. It was in a more malignant form, and they told me at that point that she was terminally ill.

I didn't really believe it last January, a year ago, when they told me that. We put her in a nursing home where she underwent therapy to teach her to walk again with a walker, with the hope that we could bring her home. She's been there all this time, gradually losing function. They had to stop the therapy because her motor control just could not control her muscles. So we have to just leave her in the nursing home there. We visit her every day, at meal times. Both daughters have been very, very faithful along with me in visiting, so that she usually has two visits every day. We're not even sure now how much she understands. She had not been able to speak since about last June or July, and she had to be fed. My daughter's down there with her now. I missed going today probably for the first time. Yesterday I didn't have to go at noon because someone else was going, but I went in the evening.

When we can't get there, the nurses will feed her, but I just can't give her up. We've been together a long time. It's been 50 years since we started our friendship, and over 44 years of marriage.

Reflections

Q: Well, you've obviously had a very long and successful career and also a happy marriage and a happy home. In order to try to put things in focus, I always like to ask one last question, and the question is, looking back on this long successful career, do you think there's anything you'd like to change if you could? Is there anything that you look back on with particular regret or something that, if you had it to do all over again, you would do it differently?

A: I'm not sure. I think I told you that I was never in a position to plan my career. I walked into the Army Engineer Office and asked them for a job, and they hired me right away. Then I got my offers from the civil service exams, and since then I never really applied for any jobs-except during World War II I had tried to get into the Army Specialist Corps, and also when I found out what a wonderful place San Francisco was, I inquired about the possibility of getting

a job with the Federal Power Commission down there, but I never got to the point of really applying. I was at the Seattle District Office in connection with the flood control on the project I was working on and asked them if they needed anybody. I didn't really want to get into specifications, but they transferred me up there under the wartime rules that gave priority for war-related work.

So I guess I've just gone the way the wind has blown me, but I've had a lot of fun. When you ask if there are anything that I have regrets about, I guess I have to go back to my love of the outdoors. I tried to put it first, but not always successfully. I went every year for 25 years to climb in the West or in Switzerland or in Scotland or Canada. That has been a very important part of my life. I got obsessed with the idea of climbing mountains. I guess it really is an obsession, and so my greatest regret is that I wished I had climbed more mountains when I was still able to.

There were not many times that I missed an opportunity to go climbing but there were some. Climbing was probably more of a challenge for me because of having had polio, which left me with a weak leg, but it was something I could do. I sometimes feel if I had worked more diligently and organized my life better around my work, that I could probably have achieved a lot more. Yet, I think I have put the important things in my life first, which were family relationships and my love of the outdoors and music.

We haven't even discussed my love of opera, and that goes back to high school days when I was naughty and threw some spitballs or something in a music class. My music teacher, Murial Huffman, as penance for whatever I had done, made me give a report on the radio production of an opera. This must have been on a Saturday, long before Texaco took over the Metropolitan Opera broadcasts. The opera was *Tannhauser*. The assignment just turned something on inside me. My family was not really very musical. My mother wanted me to take piano lessons, but I never would. I wanted to spend my spare time outdoors. But when I listened to *Tannhauser,* I was just thrilled by it, and particularly by Wagner. Later when I heard *Die Meistersinger* with Hans Sachs hammering his shoes, I identified it with my grandfather.

I love symphonic music also, particularly the French romantic music. I was first introduced to that by Kay before she became my wife. In the first or second letter she wrote me, she told about how she loved the Franck Symphony

in D Minor, and then I discussed Berlioz, d'Indy, Chausson, and Debussy. I love their kind of music along with Wagnerian and, of course, who doesn't love Verdi and Rossini and Puccini. So I'm very, very emotionally involved with opera.

Q: Yes, I noticed the music on the piano so I guessed as much.

A: Those are remnants of better days, when Kay used to play the piano. It is very hard for me to change anything that Kay left around here. It all happened so suddenly, and I expected her to be back after the operation. I don't play the piano. Both daughters took piano lessons, and they could play reasonably well, but they gave it up and went on into other instruments. My musical interests revolve around symphony concerts and opera.

Getting back to your theme of regrets about things you might have done, I can't help wondering if there were anything that I could have done that would have kept Kay from getting to the stage she is in. Could we have sought help elsewhere, Johns Hopkins or the Mayo Clinic? We did go out to the National Institute of Health, but Kay's condition didn't fit any of their research parameters.

Sometimes I wonder if I should have left the government to seek greater remuneration in the private sector. In 1939 it was the way to go, but then during World War II, for example, the government salaries were kept way below everybody else's salary. But at that time if you had resigned, they said it would be accepted with prejudice. I don't know what that meant, and it probably wouldn't have meant anything if they needed you back. When the government salaries finally started to come up in the '60s, it was long overdue.

One reason Kay and I didn't have children until we were married 10 years was that we couldn't afford to. I was a P-3 when we got married which is the equivalent of about a GS-9, I guess. Kay was working at the library and we could barely make it in Seattle. When we came to Washington it was even worse, and I had gone up a grade. And so that was one reason we were married 10 years before Mary Jane was born. I was old fashioned, I guess, because I couldn't conceive of a family with children where the mother worked outside the home. So it took a long time before we were able to afford to have

children. Kay didn't have to work, but she enjoyed the part-time work for the Triple A which enabled us to have a full-time maid at home.

The things I have enjoyed most have been starting off from scratch with the National Water Commission and the Senate Select Committee, although with the Senate Select Committee I had the benefit of the preliminary work done by Ed Ackerman. I knew enough people and had enough contacts to get all the help I needed on the National Water Commission, and so it's hard for me to think of anything now that leaves me with any regrets, except for the mountains that I didn't climb. I'm sure that I'll think of some things that I wish I had said in this interview. Even though I have been very verbose in this interview, there are a lot of things that I have not covered. But you can't cover everything, and I feel embarrassed that I have been so verbose and that you've taken two full days to do the interview.

Q: It was well worth it. I thank you very much for your time.

Kay died on August 14, 1989, shortly after her 72nd birthday. Her book, ***Run Eunice,*** was published in 1990, and a book of her letters, *They Call Me Kay,* was published in 1994.

Abbreviations and Acronyms

AWR	Arkansas-White-Red
BOB	Bureau of the Budget
BOD	Biochemical Oxygen Demand
CEEB	College Entrance Examination Board
CETS	Commission on Engineering and Technical Systems
CMTC	Citizens Military Training Corps
CPSMR	Commission on Physical Sciences, Mathematics, and Resources
c s c	Civil Service Commission
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FIARBC (FIREBRICK)	Federal Inter-Agency River Basin Commission
FPC	Federal Power Commission
GAO	General Accounting Office
GSA	General Services Administration
HABS	Historic American Buildings Survey
HECP	Harbor Entrance Command Posts
HEDP	Harbor Entrance Defense Posts
ICWP	Interstate Council on Water Policy
ICWR (ICEWATER) .	Xnter-Agency Committee on Water Resources
MIT	Massachusetts Institute of Technology
MR&T	Mississippi River & Tributaries Project
NASA	National Aeronautics and Space Administration
NAWAPA	National Water and Power Alliance
NEPA	National Environmental Policy Act

NRC	National Resources Committee
NRPB	National Resources Planning Board
NYA	National Youth Administration
OMVG	*Organization de Mise et Valeur de la Fleuve, Gambia*
PWA	Public Works Administration
REA	Rural Electrification Association
RFF	Resources for the Future
ROTC	Reserve Officer Training Corps
SCS	Soil Conservation Service
TAMS	Tippetts, Abbet, McCarthy, Stratton
TVA	Tennessee Valley Authority
USAID	United States Agency for International Development
USED	United States Engineer Department
WPA	Works Progress Administration
WSTB	Water Services and Technology Board
YMCA	Young Men's Christian Association

Index

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