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	Engineer Memoirs LIEUTENANT GENERAL ERNEST GRAVES	
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Engineer Memoirs

LIEUTENANT GENERAL ERNEST GRAVES

U.S. Army

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Foreword

This is the tenth publication in the *Engineer Memoirs* series of career interviews. The series contains the selected recollections of major figures in recent Corps history. These memoirs lend important perspective to decision-making, now and in the future. By making these recollections available, the series preserves and shares the knowledge and experience of retired Corps officers and civilians.

Ernest Graves had a distinguished career in the United States Army, which culminated with his three-year tenure as Director of the Defense Security Assistance Agency. Along the way, he also served as commander of an engineer battalion and group, as division engineer for the North Central Division, as Director of Civil Works, and as Deputy Chief of Engineers. I recommend this interview to thoughtful officers and civilians of the engineer family.


OTIS WILLIAMS
Colonel, Corps of Engineers
Chief of Staff

The Interviewer

Dr. Frank N. Schubert is the chief of joint operational history in the Joint History Office, Office of the Chairman, Joint Chiefs of Staff. He is a graduate of Howard University and holds a Ph.D. from the University of Toledo. Dr. Schubert's 20 years as a Department of Defense historian include 13 with the Army Corps of Engineers (1977–1989). He is the author of *Building Air Bases in the Negev: The U.S. Army Corps of Engineers in Israel, 1979–1982* (1992), *Buffalo Soldiers, Braves, and Brass: The Story of Fort Robinson, Nebraska* (1993), and *On the Trail of the Buffalo Soldier: Biographies of African Americans in the U.S. Army, 1866–1917* (1995). He and Theresa L. Krause are general editors of *The Whirlwind War: The United States Army in Operations Desert Shield and Desert Storm* (1995). His latest work is *Black Valor: Buffalo Soldiers and the Medal of Honor 1870–1898* (1997).

Acknowledgments

Dr. Barry W. Fowle, Director of the Oral History Program, Office of History, Headquarters, U.S. Army Corps of Engineers, was responsible for publishing this manuscript. Marilyn Hunter, also of the Office of History, provided editorial and technical support.

Constance Potter edited the manuscript, and Lieutenant Colonel Adrian Traas made known the Vietnam interview published as Part II.

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Ernest Graves, Jr.

The career of Ernest Graves reflects the diversity of duties that an engineer officer may be called upon to perform: troop leader, scientist and engineer, project manager, general staff officer, senior commander, and director of national programs.

Lieutenant General Ernest Graves' career as an Army officer began in 1944 when he graduated from West Point and received his commission as a second lieutenant in the Corps of Engineers. That summer he attended the Engineer Officer Basic Course and commanded a platoon in the Engineer Replacement Training Center at Fort Belvoir, Virginia.

In October he flew to Europe for assignment to Headquarters, Communications Zone, in Paris, where he worked in the Control Section, a group that kept statistics on all logistic activity. At the end of 1944 he was reassigned to command a platoon in the 1282d Engineer Combat Battalion, training at the time in England. The battalion deployed to Germany in April 1945, then in June left for the Pacific theater by way of Marseilles and the Panama Canal.

When the 1282d Engineer Battalion arrived in the Philippines at the end of August 1945, it was sent first to Clark Field, then to San Jose in central Luzon. In October Lieutenant Graves transferred to the Engineer Construction Command and deployed with the headquarters to Japan. He ended up in the Construction Division, Engineer Section, of Eighth Army headquarters in Yokohama, becoming chief of the Buildings, Camps, and Hospitals Section with responsibility for this type of construction for the army of occupation throughout the Tokyo–Yokohama area.

Graves left Japan in September 1946 for assignment to the Manhattan Project at Sandia Base in Albuquerque, New Mexico—one of a group of officers selected by Lieutenant General Leslie Groves to form a military unit to assemble nuclear weapons. Graves was in Company B, the assembly company, of the 38th Engineer Battalion (Special) and spent time on a team that assembled the nuclear cores, first at Los Alamos, then at the Sandstone nuclear test series at Eniwetok Atoll.

Captain Graves began his graduate schooling in June 1948, first completing a year of courses in mathematics, physics, and chemistry at the Naval Postgraduate School in Annapolis, Maryland. From 1949 to 1951 he attended the Massachusetts Institute of Technology in Cambridge, Massachusetts, earning a Ph.D. in physics. It was here that he met and married his wife Nancy.

After receiving his degree from MIT in September 1951, Major Graves was assigned to the Supreme Headquarters Allied Powers, Europe, in Paris, France. For the first year in SHAPE he was the assistant executive officer in the Office of the Special Assistant to the Chief of Staff. Then from 1952 to 1954 he was assigned as a staff engineer in the Airfield Construction Section, Engineer Branch, Logistics Division, working on the NATO infrastructure program. One of his first jobs in infrastructure was preparing the NATO airfield standards following the Lisbon meeting of the North Atlantic Council. The standards were a detailed list of operational facilities that had to be provided at each NATO airfield for it to qualify for allied cost sharing.

After attending the Engineer Officer Advanced Course in 1954–1955, Major Graves was assigned for two years as Chief, Training Section, Nuclear Power Branch, U.S. Army Engineer Research and Development Laboratories, at Fort Belvoir. The Army constructed a nuclear power plant at Fort Belvoir, and Graves was in charge of putting together the crew for the plant and organizing the whole training program, both graduate schooling for officers and technical training for crews.

Major Graves attended the Command and General Staff College in 1957–1958, then was assigned to command the 44th Engineer Construction Battalion in Bup Yong, Korea. During his year in command the battalion built a large storage area for Honest John missiles at Osan, did asphalt paving in the area of the 7th Infantry Division just south of the DMZ, and began construction of the depot complex at Waegwan.

In 1959 Graves was assigned as a research associate in the Plowshare Program at the Lawrence Radiation Laboratory in Livermore, California. His mission was to learn about the peaceful use of nuclear explosives to perform excavation, possibly in the construction of a sea-level canal across the Isthmus of Panama. Most of his assignments for the next seven years were spent working on engineering and policy issues affecting the Panama Canal.

In spring 1961 Lieutenant Colonel Graves was reassigned as the Deputy District Engineer in the Los Angeles District of the Corps of Engineers. However, that fall he was ordered on temporary duty to Washington to serve as a technical consultant to the Inter-Agency Study Group on Panama Canal Policy and Relations with Panama. With the study group's recommendations approved in a national security action memorandum signed by President Kennedy in spring 1962, Graves was ordered back to Livermore to establish the U.S. Army Engineer Nuclear Cratering Group. He served as the group's director from 1962 to 1964, leading the Corps of Engineers portion of the research program aimed at determining the feasibility of using nuclear excavation to dig a sea-level canal.

After attending the Army War College at Carlisle Barracks, Pennsylvania, in 1964–1965, Graves became a staff officer in the Office of the Deputy Under Secretary of the Army (International Affairs) in the Pentagon. In February 1967 he was appointed Executive to the

Secretary of the Army. While in that position he attended the Advanced Management Program at the Harvard Business School in Cambridge, Massachusetts.

In September 1968 Colonel Graves assumed command of the 34th Engineer Group in the Mekong Delta of Vietnam. The five battalions in the group supported the 9th Infantry Division and the IV Corps Area Adviser and rebuilt major sections of QL-4, the main highway extending south into the delta.

On returning from Vietnam in September 1969, Graves became Deputy Director of Military Construction in the Office of the Chief of Engineers. This directorate was in charge of approximately \$1 billion of military construction annually, including the entire Army program and a large portion of the Air Force program. Graves' responsibilities also included direction of Corps of Engineers construction for the National Aeronautics and Space Administration and Corps support of Army facilities engineers worldwide. During this period Brigadier General Graves also served for six months as president of the Air Defense Evaluation Board tasked to recommend whether or not to undertake engineering development of the Patriot air defense missile system.

In December 1970 Graves became Division Engineer of the North Central Division of the Corps in Chicago, Illinois. He was responsible for Army Corps of Engineers water resource activities in all or parts of 12 states, including the Upper Mississippi River basin and the Great Lakes. Major activities during his three years in Chicago were the program of diked disposal of dredge spoil, flood protection against record high levels on the Great Lakes, and reaching decisions with his Canadian counterparts in his capacity as Chairman, U.S. Section, of five different boards under the jurisdiction of the International Joint Commission for U.S.-Canadian boundary waters.

In December 1973 Major General Graves returned to Washington to become Director of Military Application in the Atomic Energy Commission, then the Energy Research and Development Administration. In this position he was responsible for all U.S. nuclear weapons development, testing, and production, as well as cooperation with the British government's nuclear weapons program. His job was to put the program together each year, defend it before Congress, then oversee its execution by the weapons laboratories at Los Alamos, Livermore, and Albuquerque; the test site in Nevada; and the production contractors throughout the United States.

General Graves became Director of Civil Works in the Office of the Chief of Engineers in September 1975, with responsibility for directing a \$2.5 billion annual program of investigation, design, construction, operation, and maintenance of works for navigation, flood control, hydroelectric power production, water supply, water quality, recreation, fish and wildlife protection, and beach and shore protection. Of the many issues addressed during his two years

in the position, the most challenging was the review of all the Corps' water projects, undertaken when President Carter ordered 35 projects stopped in February 1977.

In July 1977 General Graves became Deputy Chief of Engineers, serving as the principal assistant and adviser to the Chief of Engineers for both the military and civil missions of the Corps.

General Graves became Director of the Defense Security Assistance Agency in March 1978 and was promoted to lieutenant general. In this position he was responsible for managing and administering the entire program of security assistance and arms sales carried out by the Department of Defense. During this period the largest sales were to the Middle East, including Iran, Saudi Arabia, Israel, and Egypt. The programs for Israel and Egypt were tied closely to the Camp David peace accords.

General Graves retired from the Army in July 1981 and later that year became a consultant to the Center for Strategic and International Studies (CSIS) in Washington. As a senior adviser at CSIS he took part in a series of studies on the use of foreign assistance as an instrument of foreign policy and national security, several times serving as the study director. In the late 1990's he was concentrating on helping CSIS with its financial management and introduction of new computer systems and software.

Personal Data

Date and Place of Birth: 6 July 1924, New York City

Parents: Colonel Ernest Graves and Lucy Birnie Graves

Marriage: Nancy Herbert Barclay, Paoli, Pennsylvania, 12 May 1951

Children: Ralph Henry, Robert Barclay, William Hooper, Emily Birnie

Career Summary

1941–1944

Cadet, United States Military Academy, West Point, New York
Second lieutenant, 6 June 1944

1944

Basic Officer Course, The Engineer School, Fort Belvoir, Virginia
Control Section, Headquarters, Communications Zone, European Theater of
Operations, Paris, France
First lieutenant, 6 December 1944

1945–1946

Platoon leader, 1282d Engineer Combat Battalion, England and European Theater
of Operations
Staff Officer, Construction Division, Headquarters, Eighth Army, Yokohama, Japan
Captain, 3 January 1946

1946–1947

Assembly Company, Engineer Battalion, Manhattan Project, Sandia Base and Los
Alamos, New Mexico

1948–1949

U.S. Naval Postgraduate School, Annapolis, Maryland

1949–1951

Ph.D. in physics, Massachusetts Institute of Technology, Cambridge, Massachusetts
Major, 25 July 1951

1951–1954

Assistant Executive Officer, Office, Special Assistant to the Chief of Staff, Supreme Headquarters Allied Powers, Europe, Paris, France, 1951–1952
Staff Engineer, Airfield Construction Section, Engineer Branch, Logistics Division, Supreme Headquarters Allied Powers, Europe, Paris, France, 1952–1954

1955–1957

Chief, Training Section, Nuclear Power Branch, U.S. Army Engineer Research and Development Laboratories, Fort Belvoir, Virginia

1957–1958

Command and General Staff College, Fort Leavenworth, Kansas

1958–1959

Commander, 44th Engineer Construction Battalion, Bup Yong, Korea

1959–1961

Research Associate, Lawrence Radiation Laboratory, Livermore, California
Lieutenant Colonel, 29 March 1960

1961

Deputy District Engineer, Los Angeles District, U.S. Army Corps of Engineers, Los Angeles, California

1961–1962

Consultant, Inter-Agency Study Group on Panama Canal Policy and Relations with Panama, Washington, D.C.

1962–1964

Director, U.S. Army Engineer Nuclear Cratering Group, Lawrence Radiation Laboratory, Livermore, California

1964–1965

Army War College, Carlisle Barracks, Pennsylvania

1965–1967

Staff Officer, Office of the Deputy Under Secretary of the Army (International Affairs), Washington, D.C.
Colonel, 6 April 1966

1967–1968

Executive to the Secretary of the Army, Washington, D.C.
Advanced Management Program, Harvard Business School, Cambridge,
Massachusetts, 1968

1968–1969

Commander, 34th Engineer Group, Vung Tau and Can Tho, Vietnam

1969–1970

Deputy Director of Military Construction, Headquarters, U.S. Army Corps of
Engineers, Washington, D.C.
Brigadier General, 10 October 1969
President, U.S. Army Air Defense Evaluation Board, Washington, D.C., 1970

1970–1973

Division Engineer, North Central Division, U.S. Army Corps of Engineers, Chicago,
Illinois
Major General, 1 August 1971

1973–1975

Director of Military Application, U.S. Atomic Energy Commission and U.S. Energy
Research and Development Administration, Washington, D. C.

1975–1977

Director of Civil Works, Headquarters, U.S. Army Corps of Engineers, Washington,
D. C.

1977–1978

Deputy Chief of Engineers, U. S. Army, Washington, D. C.

1978–1981

Director, Defense Security Assistance Agency, Washington, D. C.
Lieutenant General, 1 March 1978

1981–present

Senior Adviser, Center for Strategic and International Studies, Washington, D.C.
Consultant, Burdeshaw Associates, Bethesda, Maryland (until 1992)

Awards

Defense Distinguished Service Medal
Army Distinguished Service Medal
Legion of Merit (with Oak Leaf Cluster)
Bronze Star Medal
Air Medal (with Oak Leaf Cluster)
Army Commendation Medal (with three Oak Leaf Clusters)

Engineer Memoirs

LIEUTENANT GENERAL ERNEST GRAVES

U.S. Army



Lieutenant General Ernest Graves

Part I
Lieutenant General Ernest Graves¹

The Early Years, 1924–1946

Q: General Graves, when you were born in 1924, your father [Colonel Ernest Graves] had been retired from the Army for about three years.

A: That's right. He was retired for deafness in 1921.

Q: For deafness. I remember that they said for disability.

A: He was quite deaf and that was the proximate reason for his retirement.

Q: And he went into what kind of work in New York, do you remember?

A: He didn't do anything at first. He used to go down to the stock market and watch the ticker all day. He concluded after about a year that he wasn't temperamentally suited to making money on the stock market. He was a trader at the time.

Q: Oh, he was?

A: He was buying and selling stocks for short-term gain, but he concluded that he didn't have the personality to cut his losses or take his profits at the right time, although he was a very bright guy. Then he met my mother through his younger brother. His younger brother, Louis, had been a colleague of my mother's first husband. They were reporters on the *New York Times*. My mother's first husband died of tuberculosis.

Q: What was her maiden name?

¹Dr. Frank N. Schubert conducted this tape-recorded interview with Lieutenant General (Ret.) Ernest Graves in Arlington, Virginia. The interview took place in eight sessions during February, March, and April, 1985. Both General Graves and Dr. Schubert edited the transcript. The original tapes and unedited manuscript are in the Research Collections, Office of History, U.S. Army Corps of Engineers, Alexandria, Virginia.

A: Her maiden name was Lucy Birnie, and her name at the time she and my father met was Horgan. Her first husband was Harry Horgan. He was a newspaperman on the *New York Times*. So were my father's two brothers. His older brother Ralph and his younger brother Louis both wrote for the *New York Times*.

It was Louis who had been the close friend of Harry Horgan. My mother was widowed in 1918. My father was a bachelor in New York. My uncle Louis introduced them, and that's the way they came to marry in 1923.

Q: My goodness. It hadn't occurred to me until you mentioned it, but indeed, your father was quite a mature man when you were born.

A: Yes. My father, for reasons that I don't entirely understand, never was much interested in marriage or women up until that time in his life. He grew up in a woman-dominated home. His father [Ralph H. Graves] had died when he was nine. His mother [Julia Hooper Graves] scraped along down in Chapel Hill [North Carolina]. She had a house—in fact, she had four houses. She lived in one and she rented the others. I won't say they were poor, but they didn't have any money. My grandmother and an aunt [Emma Graves] of my father's ran this show. As my father talked about it afterwards, he was—well, embittered would be too strong a word—but he had a very reserved attitude toward the way women conducted things. It took my mother to turn that around, I guess.

Q: And a lot of time.

A: Yes. A lot of time. His military career was out in the sticks wherever possible. Right after he was at West Point, he served at [Fort] Leavenworth [Kansas] in the 3d Engineers. [Douglas] MacArthur was also in that same battalion.

He went to the Philippines and was there in 1909 and 1910, building the first fortifications on Corregidor. After that he came back and went into Mexico on the punitive expedition with



Ernest Graves, Sr., as a cadet. United States Military Academy, class of 1905.

[General John J.] Pershing. He commanded the lead engineer company. They built a road into Mexico to support Pershing's cavalry. My father's company built this road for the supply trucks along the trace of an existing trail.

That's the way he met Pershing, and that's the way he came to go to France. He went to France on the *Baltic*, which was the ship that Pershing went over on.

Q: So he requested your father?

A: Yes. The minute my father heard about Pershing's being selected to command the AEF [American Expeditionary Force], he sent a telegram. My father was down in Texas at the time—maybe in San Antonio. He sent a telegram asking Pershing to consider him. Pershing did request him, and my father went over on the *Baltic* with Pershing.

I won't take the time to tell about all his assignments, but the point is that most of his life was spent out in the field.

Q: Was that deliberate, do you think?

A: Yes. That was what he was interested in. He wasn't a headquarters soldier. For example, in France he started out on the staff, but very soon he left headquarters and was put in charge of the construction program for the Intermediate Section.

The way our supply system was organized in France in World War I was not too different from the way it was in World War II. We had an Advance Section, which was the one that was up next to the combat zone. Then there was an Intermediate Section, which had depots and railroads. Then there was the Base Section, which was along the coast.

In World War I the Americans went in through Bordeaux. Bordeaux was the large port, but from Bordeaux forward there was a whole network of railroads and depots handling the flow of supplies.

My father was in charge of all the construction in the Intermediate Section. This is where that famous story came from about building the warehouses. My father told them to cut back on the amount of lumber and nails in the warehouses. And they did. They were building a whole series of warehouses. Then he told them to cut back again. And then he told them to cut back a third time. The people came in very concerned because a warehouse had fallen down. My father said, "That's great. Add a pound of nails and two boards and build the rest of them that way."

Q: Where did you hear this story?

- A: I heard it from my father. I heard it from many of his colleagues. The last time I heard it was from [Major] General Charles [G.] Holle, whom I went to see over the Christmas holidays. He told it to me once again. This is a true story, and it contains a very important lesson, or principle, in construction in war. This is that you should use the minimum amount of material needed to accomplish the mission, because everything is at a premium in war.
- Q: When we get back to talking about your construction group in Vietnam, I am going to raise this question, okay?
- A: All right. I'll tell you right now we violated that totally in Vietnam. But a very important point is that Pershing, as a commander, was very attuned to these logistic principles—the importance of austerity. There weren't enough resources. There weren't enough engineer troops. There wasn't enough lumber. There wasn't enough of anything in World War I.
- Q: I guess in lumber, in particular—
- A: Lumber, of course, in France—
- Q: The largest engineer unit in France was a forestry outfit.
- A: Right. Given the constraints on time and resources, they had to try to do everything with as little material and effort as possible. It was pointless to build something that would last for any length of time. My father used to say that this was one of the problems with the engineers who came into the Army from civil life—the architects and engineers who came into the Army from civil life during World War I. They were very capable engineers, but they brought the concept of factors of safety from their civilian experience. It was hard to get them to accept the concept that we didn't need factors of safety in construction that was only supposed to last for six months or a year.
- Q: We never retained that lesson, did we, anywhere?
- A: Not recently. I think you would find it practiced in World War II, when there were people in charge like [General Brehon B.] Somervell. Incidentally, he and my father were very close friends from their time together in World War I. Those people brought the lesson with them.
- Q: So the lesson did carry over.
- A: I think the top engineer and logistic leadership in World War II, for the most part, had had that World War I experience—Somervell, [Brigadier General James H.] Stratton,

a whole array of people who were on his staff, [Lieutenant General John C. H.] Lee in Europe, and so forth.

They knew about these things, but we didn't preserve it after World War II. We can talk about this later, because this is one of the things that, in my opinion, we definitely didn't get right in Vietnam.

Q: When you were young, did your father like to talk about his experiences in the Army?

A: Yes. One of the inspirations of my life was his talking about all these experiences. That's the reason that I went into the Army. From the time I was very little, I was fascinated with the things he had done, and I wanted to do the same kind of thing.

Q: I was going to ask you that myself, about whether there was any question about what kind of career you were interested in.

A: Well, no, there wasn't. But you know, it wasn't parental pressure to do what my father had done, so much. It was that I wanted to do the kind of engineering things he had done. I don't remember the incident, but somebody asked me when I was about five years old what I wanted to be when I grew up, and I said, "I want to be an Army engineer." They had expected me to say that I wanted to be a fireman or something like that.

Q: That's right. Yes.

A: From the time I was very little, I had heard about this and all the time I was growing up. Something that enhanced this was that my father's friends would come to dinner and talk about these things, not only the things they had done in the past when they had been together, but things that were going on at the time with the Corps of Engineers in the 1930s. I would sit over in the corner and listen to all of this. This was a terrific education for me to hear these men discussing all these engineer subjects.

Q: Sure. Did you meet John Pershing?

A: I did meet General Pershing, briefly, in an interesting way. My mother and I were in Edmunds Optician on 15th Street, and my mother saw General Pershing getting fitted for glasses. I was there being fitted for glasses, also. She took me over to where he was sitting and said that she wanted to apologize for disturbing General Pershing, but that she wanted me to have a chance to meet him because he and my father had served together. He was very gracious.

Q: Did your father have a pretty high opinion of him as a commander?

A: Oh, yes. My father was a great admirer of Pershing. A great admirer of Pershing because of his grasp of all the elements of war and especially his grasp of military logistics. That's an aspect of Pershing that you don't read about very much.

My father felt that some combat commanders don't grasp the importance of logistics, but that Pershing clearly did. Of course, he had many other strong points besides that.

Q: There are some historians who say the smartest thing he ever did was marry [Senator] Francis E. Warren's daughter [Helen Frances Warren].

A: Well, of course, the rapidity with which he rose in the Army was attributed to his connections. But I think my father and his compatriots also thought Pershing had a lot on the ball.

Q: That he deserved the rise.

A: Yes. Exactly.

Q: Where did you grow up?

A: I grew up in Washington, D.C. My father had been living on his Army retired pay. When he got married, he felt that he had to have more money than that.

He worked briefly in New York for a shellac company, the Marx and Rowalley Shellac Company, trying to rebuild this company, which was on very hard times. They did turn it around, but my father felt that they weren't paying him enough. They didn't want to pay him any more, so he left them. He came down to Washington in a very interesting way. Some friends of his called him and said they wanted him to come to Washington to be the chief engineer on the National Press Building, which was being built at the corner of 14th and F streets. My father, because of his deafness, seldom talked on the phone. My mother was on the phone, and he kept saying, "No, I'm not going to do that." Finally, he named what was then, he thought, an outrageous price, that he would not come for less than \$14,000 a year, which was pretty good pay back in those days.

The person who was trying to persuade him to come immediately said he could have \$14,000 a year. So my father went. His office was in the Willard Hotel. According to my father, he never did anything except sit in the office and look out the window at the construction. But the interesting part is that according to my father, they were watering the stock. The finances were very bad. They put out a brochure, a prospectus for the stock, and among other things, they put my father's picture there as chief engineer.

My uncle [Louis Graves] down in North Carolina bought some of the stock for my grandmother. He called up and told my father with great pride that he had done this. My father did two things. First, he told my uncle to sell the stock immediately. And second, he resigned. The point was that, as far as he could see, all they were doing was using his name to sell stock that he didn't think was of proper value.

Q: Not everyone would react that way.

A: No, but that was the ethic of the officers out of that era. We read so much in the paper today about conflicts of interest. You go back to that era, and the officers generally were much more straight-laced in their standards about any business that traded on their military career. It was much more of an ethical issue for them.

Q: Do you remember the name of the firm that was building the building, by the way?

A: No. I'll look and see if I can find that, but I don't remember what the construction firm was.

Q: He stayed in Washington, then?

A: He stayed in Washington. As a matter of fact, I think my mother and I were still back up in New York when this particular incident happened. What happened next was that [Major] General [Edgar] Jadwin, the Chief of Engineers, arranged to bring my father back on active duty. He and my father had been very close associates in World War I. Jadwin arranged for my father to be chairman of the Interoceanic Canal Commission, one of many boards that studied canals through the Isthmus of Panama and through Nicaragua.

Q: A connection you maintained.

A: Yes. That's right. The Interoceanic Canal Commission was looking particularly at Nicaragua as an alternate route for a second canal. This would have been in 1926 and 1927. My father came back on active duty for that. He then stayed on active duty and became involved with the civil works program. This was at the time of the 1927 flood on the Mississippi River. As a result of this flood, Congress passed the 1928 Flood Control Act, which was a milestone in changing the federal role in flood control. My father was one of the key people involved in writing that legislation.

Q: Ah! How did he come to have that role?

A: I think two reasons. One is that he had been the district engineer in Vicksburg [Mississippi] back in the teens. He was there in 1913. So he had experience in the

valley. He knew about the flood control. The second reason was that the Nicaraguan Canal Board had completed its work, and Jadwin turned to my father as one of his capable people to deal with the flood control problem.

Up to that time, the Corps had had only very limited responsibility for flood control on the Mississippi. After the 1927 flood, there was a clamor for the Corps to do more. A few Corps officers put together a concept. It had two elements. One was to have a plan. They hadn't really had a unified plan up to that point. The other was to support this plan with much greater federal contributions. While there had been some federal work up to that time, previous legislation did not provide that the federal government would be responsible for flood control. That was a local responsibility. This policy was a watershed with two aspects—the engineering aspect and the aspect of responsibility for funding.

Q: It is really unusual for an engineer officer to be involved in writing a piece of legislation.

A: That's right. But that continued during the 1930s, partly because of the Depression. Of course, the 1928 act was during the Coolidge administration. Incidentally, [Calvin] Coolidge was one of my father's heroes, although many people have not thought Coolidge was a very good President. My father had the other view.

The flood opened a great opportunity for the Corps. The members of Congress and the people in the valley turned to the Corps of Engineers for help. This brings out one of the themes that I am sure we will return to as we talk here. One of the historic strengths of the Corps is that they have had good people. They have had people with a lot of brains. They have had people with a lot of motivation, people that were interested in getting things done.

This is the reason you see the Corps involved in these things. They do this in peacetime and then when the war comes along, they do it again. A different group might not have reacted to the 1927 flood the same way. The Corps saw that something had to be done. The political element—the members of Congress, the governors, and the local people—all turned to the Corps, and in the Corps you had some people that knew how to put it together.

They were very savvy politically. They had ideas about how you get things done in our government. I am very proud of the fact that my father was one of the leaders of this.

Q: Do you remember that your father had regular contacts with congressmen in that area?

A: Oh, yes. Yes.

Q: Anyone in particular?

A: Well, there is a man who was always called Judge [Joseph J.] Mansfield. His son, Bruce Mansfield, worked for the Corps. Judge Mansfield was the chairman of the House Rivers and Harbors Committee, I believe it was called in those days.

There was a Congressman [William M.] Whittington who was another very powerful member of Congress.

Q: Also called “Judge,” I think.

A: Also called Judge.

These are two that I remember my father talking about. Huey Long was in the Senate, and his son, Russell Long, came along behind. The other senator from Louisiana was Senator [John H.] Overton, who appointed me to West Point. The relations between these members of Congress and the Corps of Engineers were a good example of how our government works.

Q: Senator Overton’s name is on one of those flood control acts, I think.

A: I think it is. Two Corps of Engineer civilian engineers, Val Darling and Carter Page, worked with my father from the time they were very young. Page went into the Army during the war and became a colonel and then returned to OCE [Office of the Chief of Engineers] as a civilian after the war. These three men were idea men and also the expeditors for a lot of the innovative things that happened in civil works in the 1930s.

The particular position my father occupied was on the Mississippi River Commission. In those days one of the members of the commission was in Washington. Now, of course, three division engineers and an officer from NOAA [National Oceanic and Atmospheric Administration] serve as the members from the government on the commission.

Q: So he was like the resident member here?

A: He was a resident member here. That was the title he was given. I don’t know why he was resident here, but that is what he was called, the resident member. That was the office which he occupied. He and Darling and Page were in the midst of many things.

Q: His influence so obviously transcended that of a colonel in the Army—you know, it is apparent—

A: Yes. He was a very capable guy. He was very bright, and he believed in getting things done. He had served with all these people. He had worked for Jadwin in World War I. Then, as time went on, the Chief of Engineers was somebody who was his contemporary, and then as time went on further, the Chief of Engineers was somebody who had worked for him.

Q: That's right.

A: I guess it is a measure of his relations with them that all of them admired his ability, the fact that he was a bright guy, and that he had the faculty to think these problems through.

I remember even after World War II when he was older, these people coming—often on Sunday—to visit with him and talk over what they were going to do about things.

I remember one West Point classmate who came to see him. This was before the war. That was [Major] General [Allen W.] Gullion, who became the Judge Advocate General of the Army and then later the Provost Marshal of the Army. At the time he was worried about whether he was going to be appointed Judge Advocate General, and he came to see my father to talk over what steps he should take to assure that he got this appointment.

They went over together who General Gullion knew and who he didn't know and the members of Congress and the executive branch that might possibly be involved. I don't remember the details, but that was a typical sort of discussion that people would have with my father about things they were trying to do. They would go over together how these things are decided.

Q: Kind of an elder statesman?

A: My father was not really a cynic, but he was very much a realist about why people do things. He recognized that people don't always do things for the reasons stated. They have some interest that may not be one they advertise, but when you are dealing with somebody, you need to think through what motivates that person.

Q: That's right.

A: And try to appeal to that.

Q: Now, he was born in 1880. So he was 44 when you were born.

A: Yes. That's correct.

Q: What kind of a relationship did you have? Did you see him much?

A: Oh, yes. We were very close. When I was growing up, his office hours were pretty regular. He walked to work. We lived at 1835 Phelps Place, N.W., in Washington, which is just south of where Connecticut Avenue crosses Rock Creek Park. He walked from there down 21st Street to the Munitions Building, which was next to the Reflecting Pool. His walking companion for several years was then Major, later [Lieutenant] General, [Raymond A.] Spec Wheeler. Major Wheeler lived in an apartment house just around the corner from the apartment building in which we lived. He would walk up the hill and join my father, and they would walk together to the office.

I knew this because I walked down this same hill on my way to school and very often when I was going to school, Major Wheeler would be walking up to meet my father and we would pass and I would say hello. So he knew me from the time I was a schoolboy.

Q: Where were you going to school then?

A: I was going to Saint Albans School, and I would go down to Massachusetts Avenue to get the bus to ride out to the cathedral.



*Ernest Graves, Sr., as a football coach, from the frontispiece of *The Lineman's Bible*.*

My father would walk home at night. But he had regular hours. The only trips he went on were every spring and every fall—in the spring the high-water inspection trip and in the fall the low-water inspection trip on the Mississippi River. Each would take about a week. Other than that, he was pretty much at home and I saw a lot of him. I would see him every morning and every evening, and then on the weekends we would do things together.

He had been a great football player and he was always very interested in sports. We would do things—ball games, baseball, and football—together. We were always building projects, even though we lived in a tiny apartment. He built me a fort for toy soldiers out of concrete. He cured the concrete in the bathtub. We had an electric train which was spread all over the floor. All these things we did together. So I was very close to him.

Q: And did you spend your whole childhood more or less—

A: That's right. Since he was retired, we were in one place. Well, we had lived for a year at a time in two other apartment houses, but we lived at 1835 Phelps Place from the time I was 4 until I went away to West Point when I was 16.

West Point, 1941–1944

Q: You went away kind of early to West Point.

A: The war was going on in Europe. My father, and I am sure most people like him, were convinced that we were going to get into the war. The plan had been for me to go to Princeton University for a year because I was a year ahead in school. This had come about because in primary school I had skipped half a grade. I can't remember exactly how this came about, but I was doing well, and I think they just moved me forward because of it.

Then I went to Saint Albans. I went in February, which was unusual because in that school normally you did not begin in the middle of the year. The public school had two semesters and people could enter in either September or February.

When I got to Saint Albans there was the issue of whether to move me back half a grade or up half a grade. That spring of 1938 was somewhat confused by this situation. In the end they decided to move me up, so that I was a year ahead of the normal age. When it came time for me to graduate, my father thought, which I think was right, that I needed to mature more before I went to West Point.

However, in order to see whether I would do well, he decided to have me take the West Point entrance exam as a candidate for a presidential appointment. I took it, but I did not take the physical exam. I had one bad eye. This is an example of the way my father did everything. He had worked on this problem of getting me into West Point in spite of my bad eye, and he did a brilliant job on that. He had decided that I should not take the exam and run the risk that it would be on my record that I had bad eyes. I took the mental exam. There was a misprint in one of the algebra problems and the result was that it couldn't be solved. I came home and I told him that I had not gotten one of the problems right. He said, "Well, in that case, you better not take the eye exam, because—"

Then he learned that there had been a misprint, so that the problem was thrown out and I was number six on the presidential appointment list. [Brigadier] General [Thomas D.] Stamps, then Colonel Stamps, was the professor of military art and engineering at West

Point. My father corresponded with him about the results of the test. Stamps said the rule was that I had disqualified myself because I did not take the physical exam and that, therefore, there was no question of my getting this presidential appointment.

Because of all this, I had said, if I could go that year, I wanted to go. In early June, my father came home with the news that the person who had the principal appointment from Senator Overton had failed something. We decided that I should go to see Senator Overton and ask him if he would give me this appointment.

I went to Senator Overton's office and said that I was Ernest Graves and that I had come to see Senator Overton about a possible appointment to West Point. They said he didn't have an appointment. So I went to the nearest pay phone and called my father and told him what they had said.

He said, "You wait there by the pay phone." In about five minutes the phone rang. I picked up the phone, and my father said, "They didn't know who you were." When I went back, they were very gracious and ushered me in to see Senator Overton, and he said he was delighted to give me an appointment.

I went to West Point by train, but I wasn't old enough to be admitted on July 1st. I was only 16 at the time and didn't become 17 until the 6th of July, so I couldn't be sworn in as a cadet until six days after my classmates.

That's a long answer to your question, but that's the story of how I came to go to West Point. The driving factor was that there was a war going on, and my father had always said, "You want to go to war."

Our attitude toward war is somewhat different today. His view was, which is true, even of war today, that a high percentage of the people have more opportunity and do more in a war than they do in normal life. War is dangerous and horrible, and people get killed. But the demands of war on the human being are greater than in peacetime, and for many this elicits higher achievement.

Q: Absolutely.

A: If you go back and talk to many people who were in World War II, they will tell you that it was the high point of their lives in terms of the challenges that they met, the things they did, and their achievement. It offers more opportunity and it demands more. This is what my father meant, that when he looked back over his career, the things that he had been challenged to do in World War I were more rewarding than any other part of his military career. I know exactly what he meant from my own experiences in World War II and Vietnam.



Cadet Ernest Graves on his arrival at the United States Military Academy in 1941.

Q: There must have been some anxieties involved in being the youngest—

A: There were. The main problems, as the youngest cadet in my class, were physical. I was not that poorly coordinated, but I had not built my body strength, and I had a tough time keeping up.

Q: These guys were two years older than you, a lot of them.

A: They ran all the way up to five years older. Some of them entered at 21, and some turned 22. I was just 17. Physically, I wasn't prepared. The academy had a good program, and I got better physically, but it was hard for me to do well the first summer.

Also, I wasn't as mature as most of my classmates. I was very conscientious, but I didn't have the same maturity to deal with the stresses there. I was smart enough. Academically, I was very capable and did well. That wasn't the problem.

Q: I think that you did very well there academically, as I remember.

A: My father wondered whether all the other things a plebe had to do were going to drag down my academics. As it turned out, they didn't.

Q: What's memorable to you about your experience at West Point?

A: I certainly remember those first weeks which were very tough for me. I couldn't get anything right, and I got a lot of demerits. My father had told me that I shouldn't get demerits. As a matter of fact, I had trouble most of the way through plebe year. I was never close to being found for too many demerits, but at West Point your standing is determined by a combination of all factors—your grades, your demerits, which was called "conduct." While I was there they introduced the concept of using the results of your physical fitness tests as a factor. They also had a leadership rating, which was done by the instructors in the tactical department, by the upperclassmen, and by your contemporaries.

My father followed all these things very closely. Each subject had what were called proportional parts. These determined the weight given to the different subjects.

I suspect that I was the only one—or maybe there were two cadets in my class—that ever worried about all this. I figured out at one point, perhaps with my father's help, that one demerit was worth a failing grade on one day's recitation in class.

When I went there, each cadet had to recite every day in class. You went to the board, you wrote the solutions to problems on the blackboard, and then you stood beside the board and defended your solutions. You were graded on the basis of 3.0. In other words, not 100 but 3.0, which meant there were 30 tenths. A passing grade was 2.0 and a maximum grade was 3.0.

I figured out that, in terms of proportional parts, each demerit was worth 3.0, which meant that it was equivalent to a grade of 0. I don't know how many of my classmates knew that, but that made demerits pretty important. Fortunately for me, demerits plebe year did not count toward graduation standing. By yearling year, I had got much better at these things and I had very few demerits in my first class year. Because of the war, I only went three years.

Q: I didn't know that.

A: The classes ahead of me were accelerated. The class of June of 1943 graduated in January of 1943. The class that would have graduated in 1944 graduated in June of

1943. My class, which would originally have graduated in 1945, graduated in June of 1944. So I went only three years.

Q: I see. So you started in the fall of 1941?

A: I started in July of 1941, and the United States entered the war in December of 1941.

But all the classes finished out things pretty much as planned through June of 1942. At that point, great changes started to occur. For example, the cadets who were going to go into the Army Air Corps started going off to flying training. So the program started accelerating in June of 1942, and the new first class had its final year cut short and graduated in January and so forth.

In our case the third and fourth years were compressed. Our first year was not affected. Our second year was not affected very much. We did have, in the spring of our second year, a few courses out of the third year, but not too many. Then, at that point, in the last year, we had a selection of courses from the third and fourth years, all crammed into one.

Q: So you almost did two years of academic work in one?

A: Well, we did, except that we could cover only so much ground in a year. For this reason, when it came time for me and some of my classmates and some out of the next class to go to graduate school after the war, the Army sent us to the Naval Postgraduate School to take a year of senior undergraduate courses in math, physics, and chemistry. Otherwise, we could not have done well in graduate work in the sciences, because we hadn't had the necessary undergraduate work.

A few people sent straight into graduate work had had a very tough time. They had not done well at all, even though they were very talented academically. The personnel people realized something had to be done, and they decided to send us to the Naval Postgraduate School, which was located at Annapolis [Maryland]. It has since moved to Monterey, California.

I have a lot of memories of academics, I guess, because that was what I did well at West Point. I worked hard to do well.

I sent my grades home to my father every week, and he kept a running tally of how I was doing. He compared my average with how people had done in the past. To judge how well I was going to do, he would calculate the proportional parts that I was going to have based on my grades in each course. Then he would compare these figures with past cadet records, which he obtained from the cadet register published each year.

Both [Colonel James Franklin] Jim Scoggin and I—he graduated number one—we were doing better than the prior classes. We both had higher averages than the top men in recent classes.

I didn't resent this at all. Sometimes it was tedious to copy all my grades when they were posted in the sally port each week. But I didn't feel that I was being pressured by my father about any of this. Often you run into the situation, when the parents take the kind of interest that my father did in everything I did, that the child is resentful, that there's pressure and interference. I didn't feel that way at all. The mechanics of doing it may have bothered me at times, and I sometimes made mistakes, and my father would say that he couldn't keep track of it if I didn't get it right.

But I didn't feel that I was being overly pressured by my dad. I had grown up used to having him interested in every detail, and it was tremendous support for me.

Q: Did you have any memorable instructors when you were there? Any that stand out?

A: One of the ones we remember best was a man named Metzler, who taught calculus. He had a consummate knowledge of the calculus book, and on his desk he had a black notebook that had every problem worked out. But he never opened either book. The routine in class was amusing. We would go in, and he would say, "Are there any questions?"

Then my West Point classmate, [Major Robert] Bruce Codling, would say, "Sir, may I ax [sic] a question." And Metzler would say, "Mr. Codling, I asked you first." Then Codling would say, "Sir, how do you work the first problem?" And Metzler would usually tell him something about the first problem.

Then, Codling would say, "Sir, how do you work the second problem?" And Metzler would say, "That's enough Mr. Codling." And then he would say, "Are there any other questions?" No one else would have a question. Then Metzler would say, "Take boards." Then we would be given five calculus problems to work on the blackboard.

That happened almost every day! Bruce Codling is here in town. He was an engineer, but he resigned from the Army long ago and is an executive with the gas company here in Washington, D.C. We see him occasionally.

A: There's a whole long string of instructors I could mention. One of our math instructors was Colonel [John S. B.] Dick, who later became acting dean of the academic board. He filled the position when it was first created.

Later, [Brigadier] General [Robert C.] Tripp was one of our math instructors.

There was another that was memorable. His name was [Lieutenant Colonel Horace W.] Taul. He was an engineer who had gone to West Point, but had resigned from the Army and gone into civilian practice. He taught us mechanics. He was a very bright guy, but he would take up hours telling us about his civilian experiences and going on and on about how one had to be accurate and so forth. He was a very generous grader.

I was in the first section in these subjects. The people were bright. They did well, but Taul always gave us the benefit of the doubt as to the solution. For one period of two months, I only dropped one-tenth in mechanics. However, I was number two on that because Jim Scoggin, who was number one, didn't drop any tenths at all.

This meant that we had had 25 or 30 recitations and had gotten a perfect grade every day. But this was partly, I think, because Taul was easy on us. He thought we were the best students, and he seemed more preoccupied with the practices of the engineering profession than he was with daily grades.

My instructor in engineering was [Woodrow] Woody Wilson, who became a colonel in the Corps of Engineers. He was in charge of Atlas missile site construction when the Corps was building the ICBM [intercontinental ballistic missile] installations in the 1960s.

Q: CEBMCO [Corps of Engineers Ballistic Missile Construction Office].

A: CEBMCO. [Major General Charles C.] Chuck Noble had the Minuteman sites. [Lieutenant General] Carroll Dunn commanded CEBMCO. Woody was an extraordinarily able guy. He had been quite a football player for West Point. He was back as an instructor when I was a firstclassman.

Q: Was the competition for grades pretty intense?

A: At the top level it was. The men at the top were a bunch of smart guys. Some cadets further down said you didn't have to study, which was a bunch of baloney. There was nobody who stayed in the top group without studying. Scoggin was number one and had graduated from Mississippi State before he entered West Point.

Q: So he was much older?

A: He was older, a very bright guy. But he worked hard—very hard. I worked very hard. I roomed with [Lieutenant General Kenneth B.] Ken Cooper, who graduated number five, and he worked very hard. In that kind of competition, the marginal return of more study is progressively less. You could get a 90 by opening the book for 5 minutes, and maybe you could get a 95 by opening the book for 30 minutes. You could get a perfect

grade with another half hour. The second half hour was the marginal effort to get a complete grasp of things.

I was never very good at languages, but I stood very high in German. I discovered that I really had to do all the assigned lesson before class. In West Point at that time, 90 percent of the questions or problems given in class were straight out of the book. There might be one problem not from the study assignment. In German, for example, we were given sentences to translate. We would have conversation, but then at the end to help nail the grade down, the instructor would give us three or four sentences to translate. All those sentences were in the book. They were sentences that would develop a particular aspect of grammar. If we were studying verbs, they would feature verb forms, et cetera.

A: I did every one of those sentences the night before. When I had the time and could use the book, I could do all the necessary research to get the declensions right or the number right—get all the details. The book might have ten sentences; I would do all ten. In class the instructor would give us five. I had done them all before and I could do them correctly in class.

Q: Sure.

A: That produced perfect grades. At the beginning of the year, I found out in about a week that if I waited until I got into class to try to do the sentences, I made all kinds of mistakes. I am not saying everybody worked that way, but the people at the top worked that way.

Q: Real diligence was rewarded.

A: I don't think it is any different from what you see in Olympic sports or any top-level competition. These people work their guts out to be the best, to be at or near the top. In the academic environment we had then, this was true, too.

Q: I was looking at the list of cadets in that class, and I wanted to ask you about a couple of people, in particular, who you may not ever have thought of for years. And one was Brigadier General Leo Douglas Kinnard, who has recently been the chief of military history.

A: I didn't know Doug well as a cadet. Of course, I have known him since. An able, colorful guy. Somewhat opinionated. Set his mind on goals and did the things he set his mind on. I have enjoyed my friendship with him in recent years, but I don't have any specific recollections to recount from our time together as cadets.

Q: What about the black cadets? Do you remember them?

A: Well, we had one black cadet in our class, [Lieutenant Colonel Henry] Minton Francis. He is here in Washington now, and we see him often. The academy was segregated when we were cadets.

Q: It must have been very difficult.

A: Well, it was very difficult for the black cadets. Minton Francis started out in L Company. There were two black cadets in the class of January 1943. That would have been two years ahead of us. One of them was the son of General Davis.

Q: Benjamin Davis.

A: [Lieutenant General] Benjamin [O.] Davis, Jr. went into the Air Force and was quite successful. Incidentally, in those days, cadets were assigned to companies by height—tall in the end companies, A and M, and short in the middle companies, F and G. The L Company was near the end, a relatively tall company. Benjamin O. Davis, Jr., was a big, tall guy, and Francis was tall. Cadets are no longer assigned to companies by height, so I won't talk about that any more.

The story was that to avoid problems over hazing or anything like that Benjamin O. Davis said, "I will give Francis his plebe year." Upperclassmen generally would not harass Francis.

Davis was to be in charge of Francis. I suspect this was only partially effective in practice. More than that, the black cadets were socially isolated. Francis had a room by himself. He didn't participate in any of the social activities of the class, any of the hops, or any other social gathering. It was a segregated Army, and it was a very lonely situation.

World War II Experience, 1944–1945

Q: I was kind of surprised this morning. I just learned, when I looked at your resume, that you did go to Fort Belvoir [Virginia] after you left the military academy. I thought under those conditions you might have gone straight to—

A: The Army felt that everybody needed some seasoning. The program at West Point had been shortened. Although they tried to give us troop leadership, they felt everybody needed seasoning. The engineer lieutenants from the class of 1944 went to Fort Belvoir and had a six-week basic course.

Q: That's very short.

A: Very short. Then we were assigned as platoon leaders in the replacement training center for six weeks.

Q: Where was that?

A: One center was at Belvoir. The north post at Belvoir was the ERTC, the Engineer Replacement Training Center. There were a number of training companies carrying the draftees through the 12-week cycle of individual training.

The other big center of engineer training was Fort Leonard Wood [Missouri]. There were 474 in my West Point class, of whom 54 were commissioned in the engineers. About half of them were kept in training units at Belvoir, and half went to Leonard Wood. That was for six weeks.

During my stay, the company to which I was assigned was in the last six weeks of the training cycle. We did some training with mines and booby traps, then floating bridges, then a testing period.

After that then we went down to [Camp] A. P. Hill [Virginia] for three weeks. Part of the time we bivouacked in pup tents, and part of the time we tried to build a timber bridge with pile bents. We didn't finish it, partly because the pile driver broke down.

The whole period at Belvoir was three months—six weeks in the officer basic course and six weeks as a platoon leader in a training company.

Q: So you graduated in the same month as the Normandy invasion, but it was essentially the fall by the time you got through at Fort Belvoir.

A: That's correct. We graduated June 6, which was D-day, and we were given 30 days of graduation leave. I visited some old family friends on Martha's Vineyard for much of that period.

The time at Fort Belvoir carried us through September. Lieutenant General John C. H. Lee was the commanding general of the Communications Zone [COMZ] in Europe. He and my father were great friends. He wrote my father that he wanted to get me over to France as soon as possible.

I went to see General Somervell, who was the commanding general of the Army Service Forces—another great friend of my father—and asked if I could be assigned in Europe.

Lee had sent through a request. Somervell was somewhat negative about this. He thought I should just be shuttled into the system, that I would learn more that way. But Lee's idea was that if I would go into his headquarters briefly, I would get an overview of the war that I would never get otherwise.

So I did go overseas in October and was assigned to the COMZ headquarters in Paris from the middle of October until New Year's Eve. I was not an aide. There was a rule against regular officers being aides.

I was on the headquarters staff and I lived with Lee's aides in the George V Hotel. I went on a lot of trips with him. When I wasn't doing that, I worked in the Control Section, a group that kept statistics on all the logistic activity. This section produced many different reports, some daily, some weekly, some monthly. Some of the key reports were reduced to miniature size so that they could be kept in a pocket notebook issued to all the senior officers.

Q: I think we have some of those.

A: If you do, you will find them very informative. Preparing some of the pages for these notebooks was what I did when I wasn't acting as an aide.

Q: What was General Lee like?

A: General Lee was an interesting combination. He was an extremely bright guy. He could be a very courtly gentleman. He had very high standards. His biggest shortcoming was his inability to relate to people who didn't measure up to his way of doing things. Because of this he got into awkward situations. He had awkward relationships with some of his contemporaries. I think his relationship with General [Dwight D.] Eisenhower was somewhat awkward.

He had a formula, and if you fitted into his formula, it was great. But if you didn't, then he wasn't very flexible. I am talking about interpersonal relationships.

Q: I understand.

A: I think he did a good job of running the Communications Zone. He certainly was well organized and bright. He was aggressive, and he was energetic.

There is a fundamental question about whether his ideas on military discipline were right or wrong. It was an interesting thing to watch the Army over there at that time. Eisenhower was always seen as being friendly with the troops. Eisenhower didn't have

a reputation as a disciplinarian or somebody that insisted on people doing their job—saluting and all that.

A lot of his subordinates, and Lee was a prime example of this, were very busy trying to maintain a level of discipline among the troops. Keep them in uniform, keep them out of trouble, make them salute, because this pattern of behavior produced an outfit that would accomplish its mission.

Most of the guys that were doing what Lee was doing were not popular. They were not popular with the troops and they were not popular with the press. They were characterized as martinets. But the fact is that they had to maintain some discipline and order. They were cast in the role of the bad guy. My view of Lee is that he wasn't able to lead in a way that got the sympathy or the support or even the respect of the troops. It drew on him a lot of criticism from the media, even though, of course, the media in World War II were much more muted than they have been since.

But even in those days, stories would go out and Lee would be criticized. In the end he ran into trouble with Robert Ruark in the Mediterranean.

Q: That's right! I had forgotten all about that.

A: He retired all right, but there was a lot of very bad press at the end. And what happened was typically unfortunate.

They had arranged a train to take the press from Rome down to Naples partly to show them the R&R [rest and recuperation] center that they had set up at Naples, the place where troops could go for recreation, and partly, I guess, to give the press a nice weekend—a sort of a mixed thing. As I understand it, Ruark missed the train and demanded special treatment to get down there. He was told, "You missed the train. Get yourself down there." He decided he would see what he could dig out.

Lee and his staff were living well. A lot of people were living well. Throughout the occupation people had good accommodations, they had a lot of transportation. Having known Lee well and served on his personal staff, I can vouch for his personal conduct. He was a very religious man, and he would not have been involved with women or any of the other loose conduct so prevalent in the occupation.

But I am sure he lived well. He had a limousine and many other perquisites. So it wasn't all that hard for Ruark to write a story and make Lee look bad simply by dwelling on his shortcomings.

I thought Lee was extraordinarily capable. He was very helpful to me. I learned a lot from him. Those two-and-a-half months with him, I learned a lot about the whole logistics of war. He was a good guy, but since he wasn't completely skillful in handling his relations with people, he didn't come out of the war with as fine a reputation as he deserved.

Q: That's unfortunate when that happens. He had a terrible nickname. I don't know if he was called it behind his back by his staff or—

A: "Jesus Christ Himself"?

Q: Yeah.

A: Well, his close personal staff was very loyal to him. When you got a little more removed, there was more of this feeling about him.

Q: You went to a combat battalion?

A: Yes. I went to the 1282d Engineer Combat Battalion, which was training in England. Toward the end of the war, the Army had taken quite a few people who had been in anti-aircraft units and moved them over into other units, since once we achieved air superiority, we didn't need these anti-aircraft units any more. One of these units, the 1282d, had been formed up at Camp Van Dorn in Mississippi. Over half the unit was people who had transferred into this battalion at Van Dorn. They had not completed what we would call advanced individual training. They had gone through basic organizational training, but they had not received training in most of the engineer skills.

They had arrived over in England around Christmas time and I joined them on New Year's Eve. This was right after the Battle of the Bulge, and the Army was very concerned about replacements for the units that had been overrun. The 1282d Engineer Battalion spent the entire month of January in infantry training.

We went down on the rifle range for a week, slept in pup tents in the snow. The temperature was about 20 degrees. The rest of the month was spent in scouting and patrolling and local security, all the infantry skills. However, the theater decided not to break up the unit and use the enlisted men and the NCOs [noncommissioned officers] as individual replacements. Then we were able to go ahead with our engineer training, our bridge training.

We made two trips to the Bailey bridge school that had been set up in England. We went by truck and spent a week building bridges. Units were cycled through the school in rapid succession.

Each company built one bridge a day. You had to build the bridge, take it down, and get it stacked up because there was another company coming on behind that was going to use the same site and bridging the next day. The first time through I don't remember there being tremendous pressure because the bridges were short and not too difficult.

Q: Just single Baileys.

A: Yes. Single Baileys. After a day of orientation, we built two or three fixed Baileys on successive days. Each one was a little more ambitious than the one before. The last bridge we built was a floating Bailey.

The second time we went down there, we followed the same sequence, but all the bridges were bigger. I had the whole company for the first bridge. We worked on that beast about 22 hours. We arrived at the school in the afternoon. We took that group out that night. We put one platoon to work that night digging in the footers for the bridge. They worked most of the night. Then the rest of the company came on the job about 6:00 and started putting up the bridge. It took most of the day. This was entirely by hand. There were no cranes used at all. Every panel, transom, and stringer was moved by people. If it was a double-tier bridge, the top members were hoisted shoulder high. When we built a triple-tier bridge, we got the panels to the third by laying a false deck. Everything was handled by hand. The only exception was the truck used to push the bridge to launch it.

But I was up 24 hours straight getting that first bridge built, then dismantled. Danny Geise, who was the second platoon leader, did the second one. It was a double-triple Bailey, 160 feet long, class 40. The company did better on that. He organized the job better than I had. He was a former engineer NCO who really knew how to get work done.

And the men were more skilled. They knew what they were doing. Then we built rafts and finally a double-single floating bridge out across the Thames River, which was a good-sized river where it flowed past the school.

I remember this Bailey bridge training vividly. When we got up into Germany, we never did any bridging like this. I have never seen a better school than this bridge school. There were quite a few engineer battalions training in England at the time, and they all went through this school.

Q: It almost sounds as if you were training for the Rhine River crossing.

A: That may have been what they had in mind. The commander of the engineer group under which all this took place was [Thomas H.] Tom Lipscomb. Lipscomb became a

major general. He was the engineer of Eighth Army in Korea. He was a district engineer. He was the division engineer of the North Atlantic Division. He was the deputy commander of Combat Developments Command when it was at Fort Belvoir.

Q: Maybe that's where I know the name.

A: You might have run into him. He was a colonel when he commanded the group in England. He was a West Pointer out of the class of 1934.

That's my most vivid recollection of this time in England. My battalion commander, Major [Elliott H.] DeJarnette, was relieved because things weren't going very well. He was replaced by a lieutenant colonel named [Eugene L.] Jones who had commanded another engineer battalion and had been wounded. When he had come out of the hospital, he took over from DeJarnette. Jones tried to improve things, but that was a motley rabble.

Q: Really?

A: I was very young, and I didn't know how to deal with a lot of these things. In retrospect, I didn't handle my part of it very well, and my superiors didn't either. I will give you an example of the kind of thing that happened.

During the infantry training, we were going to have a night security exercise. We had our staff meeting where all the officers assembled and the S-3 [operations and training officer] went over what we were to do. We were to march to a wooded area nearby where we were supposed to dig slit trenches to lie in and establish local security. To show you how brash I was, I had been with this outfit at the time several weeks. I got up in the middle of the staff meeting and I said, "Are we going to carry through on this? Or are we going to dig for a half an hour and decide that the ground is too hard and quit?" Well, that wasn't a very polite remark. But the S-3 said we were going to do it. There was no question. So, we went up to the woods. It was colder than hell frozen over—this was January in England—and we started trying to dig.

The ground wasn't frozen, but it was extremely rocky. People dug for about 30 minutes, but they weren't getting anywhere. The trenches were about 2-inches deep. They were trying to dig these slit trenches with entrenching tools, which all the soldiers had at that time, and they weren't getting anywhere.

About that time music started playing. The Red Cross doughnut truck had showed up, and the girls were playing music and passing out coffee and doughnuts. The company commanders immediately decided that everybody should go for doughnuts, and that was the end of the exercise.

Q: Just as you'd said.

A: Just as I'd said. It wasn't too good for a young lieutenant to get up in front of everybody and say, "Are we going to do it or not?" But the truth of the matter is, when push came to shove, they didn't do it. Everything was like that. When it came time for the test at the end of the engineer training, they failed the test. The subject I remember particularly that they failed was mines and booby traps.

Q: That's a bad one to fail.

A: Right. So we had to spend a week retraining on that. We finally left England in April.

Q: Were you feeling a little nervous leaving with this outfit?

A: Well, I was worried because I hadn't had command of people too much. I was worried about whether, if you were given something to do, were you going to get it done? I had a somewhat difficult relationship with my platoon sergeant, who was crackerjack. But I was just a kid, and I felt that I couldn't be too familiar with him, so I was very formal with him. He couldn't figure me out. His morale got very low.

Q: It's a classic second lieutenant's dilemma, though, isn't it?

A: It is a typical one. One of the other lieutenants said to me that Frenchy—the sergeant was of Cajun extraction—that his morale was very low. I thought it over briefly, then went and met with him. We talked over what he should do and what I should do. After that, I relaxed a little bit, and we got on fine.

I was very inexperienced, and I wanted to do well. I will give you an example of something I did, which I don't know that I would do again. When I got there, the people never got out of bed in the morning. They never ate breakfast because there was no formation until the first training formation. We would fall out for training at 7:30. We didn't come out earlier because it was dark. In England in the winter there is not too much daylight. As I recall, the time for training was 7:30.

The battalion or company had no formation before that. Therefore, there was no time you set aside to police up the barracks and make sure everybody was shaved for the day—nothing. When I arrived, I said, "All right, we are going to have reveille at 6:00." My platoon, the only platoon out of the whole company, perhaps out of the whole battalion, had reveille.

Q: And breakfast.

A: And breakfast. That was the right thing to do, but it was very difficult to do that type of thing when those were the only 40 men in the battalion that were doing it.

Q: Where was your company commander?

A: He was in bed, and he stayed in bed all day.

Q: That's incredible.

A: His name was Bishop. He had been a Higgins boat commander in the landing on Tarawa, he'd been shot at, he'd been scared ever since, and he never did anything. He was a sugar beet farmer from Montana. We'd have meetings with him about things we had to do and he wouldn't make decisions. Then the lieutenants would get together and decide what to do.

Q: They would have a leadership committee.

A: A committee—

Q: To run a military company.

A: The exec ranked us, although in the engineer organization in World War II there was not an exec. The TO&E [table of organization and equipment] had the company commander, three platoon leaders, and an administrative officer. The company commander was a captain. The three platoon leaders were first lieutenants and the administrative officer was a second lieutenant. The engineer company did not have an exec. In the infantry the second senior officer was the exec of the company. But in the engineers, no.

[Lieutenant] Tommy Thompson, who was the administrative officer, might have been senior to us, but the three platoon leaders would not accede to him the position of second in command because that wasn't according to the TO&E. Furthermore, he was an artillery retread and didn't know anything about engineering, whereas the three platoon leaders were engineer officers. In fact, I don't think that Thompson even wore engineer insignia. I can't remember that for sure. It was a bad scene.

Q: And that's the first unit you saw in the Army?

A: That was the first unit I served in, and I didn't know what to do. I knew that they weren't doing well, because I had been around with Lee and visited many units. From that experience I had an overall perspective of good and bad units. Having gone everywhere with Lee—to the Advance Section, to Le Havre, to Cherbourg, to the

Normandy landing areas, and all the other depot areas—gone not once but repeatedly—I had seen all types of units—good ones and bad ones. I had a very good notion of what a good unit ought to do, and this unit wasn't doing it.

Q: It must have been a kind of demoralizing experience in some ways. I mean, to have to deal with that at that level.

A: You asked whether I was concerned? I certainly was because I didn't want to be part of an outfit that was not doing well. And I felt I was. Most of the men were good people. But we didn't have the officer leadership. I will say this. I don't remember each of the members of my platoon individually, but I remember my platoon sergeant was very good. I remember my three squad leaders were very good.

If I told them, "This is what we have to do," they could do it. But it was hard to try to have one platoon out of a whole battalion perform at a high level when the others weren't.

To condemn all the officers would be unfair. There were some excellent platoon leaders, particularly Danny Geise, the former NCO. He was outstanding. He had been a master sergeant in Alaska, and he realized he was never going to get out of there unless he volunteered to go to officer candidate school. So he did. He was good. But he didn't, at least initially, try to have the order and discipline that I was trying to have.

Q: When did you get to Germany?

A: We got to Germany in the middle of April. The war was essentially over. We went into the Bad Kreuznach area and into the Saarland—Saarbrücken and Saarlautern. They scattered the battalion in that area. It was occupation duty, but we were also working to patch roads and that type of engineer work. We were there for about two months. We arrived in April and left in the middle of June for Marseilles to redeploy to the Pacific.

Q: Ah! So you really weren't in Europe very long.

A: We weren't in Europe very long. I had no real combat experience.

Q: You didn't get what your father said you ought to have.

A: That's true, although I learned a lot. Those experiences did me in good stead later, but I wasn't with a unit that was doing a lot of challenging things or accomplishing a lot.

Q: Did you redeploy to the Pacific as a battalion?

A: We did. We left Germany in the middle of June, and we were in Marseilles for a month. We turned in all our equipment. The third week in July we got on the *Luraline*. There have been many *Luralines*, but this was the latest one at that time—a Matson liner. There were 5,000 troops on board. We went across the Atlantic, through the Panama Canal, to Hawaii, to Ulithi, and then to the Philippines.

The war ended in the middle of August. We reached the Philippines the end of August. The war was over. They didn't seem to know what to do with us. They sent us up to Angeles, to a camp just outside Clark Field. After we had been there about a week, they sent us up to San Jose, which was up in the middle of Luzon, opposite the Lingayen Gulf. They sent us up there, I think, just because they had a vacant camp there. We were supposed to do training.

Q: So you were chasing the war, still.

A: I was chasing the war, but at that time, with the war over, the main interest of everybody was getting home. At the end of World War II, they had a point system, which was used to decide who would go home. A lot of this battalion had not been overseas that long. Many didn't have many points because they had only been overseas less than a year. A lot of them weren't due to go home, although some were. I concluded that I wasn't going to go anywhere in that battalion, so I went to try to call on [Major] General [Leif J.] Sverdrup, who commanded the Engineer Construction Command—called ENCOM.

Q: Where was he at that time?

A: Their headquarters was in Manila, at the Wakwak Country Club. The officer I saw there was [Brigadier General Edward A.] Eddie Brown, who was a colonel. Later he became a general. He had been in charge of personnel in the Office of the Chief of Engineers. I had met him when we were at Fort Belvoir. I had been the ranking officer of our group, since the number one man in my class went into the Signal Corps, and I was the number two man. I became the senior lieutenant in the basic course attended by the members of my West Point class commissioned in the Corps of Engineers.

Q: And the youngest.

A: And the youngest, too.

While at Fort Belvoir, I went to see Brown, partly to talk over with him my own assignment, but also to talk over the proposition that quite a few out of our class in the engineers, rather than being assigned to units, wanted to go overseas as individual replacements. That led to some of us going to Europe as individual replacements. Some

went to the Pacific. In fact, about half of the engineers did this. That was because they wanted to get involved. They thought if they went into units in the States—units that were training—those units might never get overseas. Certainly, at least, their time overseas would be much less than if they went right away. I had a couple of meetings with Colonel Brown on this subject, just to tell him the way people thought about it, and they arranged for us to be assigned pretty much in accordance with our individual preferences.

By the end of the war, Brown was the executive officer of ENCOM. I went to see him and told him that I would like to join ENCOM because ENCOM was going to Japan. And I couldn't see that the 1282d Engineers was going anywhere. So I was transferred to ENCOM.

Just to finish up with the 1282d, after I left, some of my West Point classmates who had been sent to the Philippines joined the 1282d; and, I gathered, it revived some. They moved it back down to the Manila area and it did some good work. It didn't show any promise while I was there.

I went with ENCOM to Japan. We boarded an LST [landing ship, tank] in Manila and rode it for ten days to Yokohama right after a typhoon. I have never been as sick in my life.

Eighth Army Headquarters, Japan, 1945–1946

Q: Or scared, I suppose.

A: I wasn't really scared. An LST in the Pacific Ocean on the heels of a typhoon was a very rough ride. We went to Yokohama. I won't dwell on all the organizational evolution. I ended up in the construction division of Eighth Army headquarters. That group oversaw all the construction activities in the Tokyo–Yokohama area for the army of occupation.

After a little apprentice period, and after all the people that knew anything had gone home, I became the chief of the Buildings, Camps, and Hospitals Section. This section prepared all the directives for all the construction work that was done on buildings, camps, and hospitals.

Q: That's a pretty big job.

A: It was a big job. I have no idea what the monetary value of the program was because the directives went to a Japanese agency. If we were going to use a Japanese

contractor, we sent a directive to this Japanese agency which then would arrange for the contractor. The cost of this was all coming out as reparations. We weren't budgeting for it.

We used troops to do some of the construction. They built a big prefabricated hospital in Yokohama. We did a lot of work on some Japanese hospitals that had been taken over.

I remember one of the projects was to build a psychiatric ward. The doctors told us the kinds of things you had to have in a psychiatric ward, which we didn't know anything about. All the radiators had to be enclosed in cages, because the patients would tear them out. You had to have special windows and special doors and special everything because a disturbed person could claw right through a wall if it wasn't built right. That was one of the first projects I worked on. I had a drafting section under me.

Q: So you were developing standard plans for different kinds of facilities?

A: Developing plans for buildings, camps, and hospitals. People would come in with requests. There seemed to be no restraint on that. They would come in for everything. Some outfit got a neon sign, "Home of the Something Artillery." The minute that sign lit up, we had 100 requests for neon signs. We had to decide what to do. Fortunately, my bosses said "No, we are not going to—"

Q: "We are not going to get in the neon business?"

A: "We are not going to get into the neon sign business." But you know, it was every conceivable type of construction. [Lieutenant] General [Clovis E.] Byers was the chief of staff of the Eighth Army. He had a rule, which was a good rule, but not entirely practical. Only he could sign disapprovals of requests from subordinate commanders. The letters had to say "not favorably considered" instead of "disapproved." Until we learned about this rule, we hadn't even bothered to answer the requests that we weren't going to do anything about. We just stacked them. We only worked on the ones that we were going to do something about.

My bosses, who included then Colonel—later [Major] General— [Robert G.] Bob MacDonnell, decided we were doing too much construction. To slow things down, they started requiring the disapprovals to be handled first, and the letters of disapproval then had to be sent up to General Byers. Those of us who had been stacking the disapprovals aside and working on the approvals had to shove aside all the approvals and work on the disapprovals, which meant we didn't put out any directives because all our time was spent writing the disapprovals. I was in that job for 11 months and—

Q: Where does it take us in terms of time?

A: That would take us to September of 1946.

Q: Okay. How many people did you have working for you then?

A: Oh, I suppose no more than ten.

Q: Any of them Japanese?

A: We had a couple of Japanese draftsmen. Most of the men were Army NCOs or specialists. I had one other officer working for me.

Q: You were still a lieutenant?

A: I got to be a captain in January of 1946.

Q: That's pretty early.

A: Yes, but that's what happened to everybody.

Q: I thought you had become involved with the Manhattan project in 1945.

A: No, not that early.

Q: Excuse me, before we go into that, could I interrupt? Did you see Hiroshima when you were over there?

A: I did not.

Q: Or Nagasaki? You didn't see—?

Manhattan Project and MIT, 1946–1951

A: I did not see either of those. I was very busy in this job, which I was fascinated with. I had various plans—to go down to Kyoto, to go up to Nikko. I was planning several excursions. Suddenly, the call came for certain of us to go back to Albuquerque. [Lieutenant] General [Leslie R.] Groves had come up with the idea that he wanted to form a military unit to assemble nuclear weapons.

The weapons that had been assembled up to that point had been assembled by teams of scientists and engineers from Los Alamos and Sandia Base in Albuquerque. At that stage nuclear weapons were not being mass produced as they are today or as other weapons were then. They were not being produced in a factory. All the components were made separately. Then a special team put them together.

The fusing, the batteries, and other components had to be monitored constantly. The plan didn't call for assembling a lot of weapons and having them in storage. Assembly was part of the operation. If you were going to use them, then you'd assemble them. This has evolved, but I am talking about the way it was in 1946.

Groves' concept was that you should have an Army unit, an Army engineer battalion that would assemble nuclear weapons. Company A was the security company. That was an MP [military police] operation. Company B was the assembly company.

Q: So you were in B?

A: I was in B.

Q: You were the commander of B.

A: I wasn't the commander, definitely not. All these people were officers or very senior NCOs. Groves' concept was that it all had to be done by officers. He got out the West Point register of graduates and looked only at the top 50 or so people in each class. He picked a few—most of whom were majors—from the classes of January 1943 and June 1943. Most were from the classes of 1944 and 1945. There were about 60 of us. They were all majors and captains. He brought us all to Sandia Base.

[Colonel Gilbert M.] Gil Dorland was the commander. After he retired from the Army, I think he went with one of the steel companies. [Colonel Alexander J.] Al Frolich was his deputy. They were above the battalion. Dorland was the commander of Sandia Base, and Frolich was the deputy commander of Sandia Base.

They set up a school. It was self-taught. People were told to be instructors in certain areas. They would work up classes to teach everybody the theory and practice of various disciplines—electronics, explosives, nuclear fission, et cetera.

Q: That's a long way from a battalion that flunked booby traps.

A: Yeah! It was a completely different operation. At one point along the line, I served as S-3 of the battalion as a captain. But for most of the time, most of us were technicians.

I arrived at Sandia Base in September and was there until the following August. Then I went up to Los Alamos. I am not sure about all these dates. In Los Alamos, I was assigned to assembling the cores, the nuclear components, of these weapons. In the spring of 1948 I was involved in the Sandstone nuclear tests. The earlier tests at Bikini Atoll were effects tests.

Then they moved over to Eniwetok Atoll and had these three tests, which were weapons development tests. Effects were secondary. The tests were mainly to see whether these newer designs would work. I was on the assembly team for the second of these three devices and put the nuclear components together.

Q: You weren't exactly an expert in atomic energy at that time.

A: No. I hadn't studied any more physics than my undergraduate course at West Point. We got out the books. I still have half a dozen books on nuclear physics that I bought and read at the time. I took a course in theoretical physics taught by one of the scientists at Los Alamos. There was a lot of studying going on, but none of us had any graduate training in nuclear physics.

We learned a lot about counting nuclear particles and about how these bombs worked. At Los Alamos they had seminars at which people like [Enrico] Fermi and [Edward] Teller would discuss their latest work, theoretical and experimental. [Robert] Oppenheimer had left by then, but he came back and talked. Hans Bethe visited. All the big guns in physics that you have heard of came there, but most of them were no longer there permanently.

Many who had been there during the war would come back for a week for seminars. The larger meetings were called the colloquia. We would all go and listen to them.

Q: You had some incredible exposure to—

A: Absolutely. They talked about all their ideas on how these things worked, and we tried to understand this.

Q: How did you find that?

A: I was fascinated, and it was a fun place.

Q: Was it?

A: Los Alamos was very informal. We did a lot of skiing. It is beautiful country up there in the mountains. It was a young crowd—a lot of young men and women who had a lot of fun together. It was stimulating. They were very bright and interesting.

Q: There is frequent mention of tension between the soldiers and the scientists who worked there.

A: That's interesting. I had forgotten about that. I used to have to listen by the hour to all the complaints of my civilian colleagues. Most of the Army officers fitted in very well. There were about a dozen of us at Los Alamos. We had been sent up from Sandia Base in Albuquerque, where most of the assembly work was done. About a dozen were sent up to do the nuclear assembly work.

As I said, most of us fitted in very well—as long as we were willing to listen. After all, we were not in a position of any kind of authority. We were just workers like them. Most of us, if we were willing to listen to these complaints and were sympathetic with the worst of them, got along well. We were young guys. We were at the bottom of the military heap. We thought that there were some problems up the line. So we could be sympathetic. But we certainly had to hear a lot of complaints. Yes, that was a feature of life.

Q: The military wants too many reports. The military has too many restrictions—

A: Yes. All kinds of stories—how ridiculous the whole regimentation was of the Army.

Q: Did you know General Groves from before the project?

A: Yes, I did. He and my father were great friends, and he was stationed in Washington as a lieutenant when I was a boy. His son and I rode horseback together at Fort Myer [Virginia]. There was a riding program, Army and Navy juniors, at Fort Myer. General Groves, who was a lieutenant then, normally drove his son Dick and me over there. We went three days a week. We would go after school and ride in the riding hall at Fort Myer. An artilleryman named [Major General George B.] Barth—a captain—conducted the classes. We were members of a Cub Scout troop, a mounted Cub Scout troop, probably the only one that's ever existed.

Q: That's extraordinary.



*Mounted Cub Scouts at Fort Myer, Virginia.
Jimmy Guion (left), Richard Groves (center), son of Leslie Groves, and Ernest Graves (right).*

A: We did our Cub Scout activities on Sunday. We would go to Sunday school, and then we would have a Scout meeting. That was at Myer. General Groves would take us to that, too. So I knew him. Dick and I were about nine years old at that time, so it had been that winter when I had known him very well. But he and my father were long-time associates.

But I don't think that entered in greatly in my selection to go to New Mexico. The only time I can remember that my friendship with General Groves, or his regard for my family, entered in was at the end of 1947. There was an issue about going to graduate school. The senior people at Sandia Base had not put me very high on their list of candidates to go to school. They had put other people higher up on the list.

I had asked Dorland to be put on the list to go to school, and he, as was his way, had not given me an answer.

When they announced the list of who was going, I wasn't on the list. I don't remember what I did. Maybe I told my father; maybe I told Ken Cooper who was working for Groves. Anyway, I got the word to General Groves that I wanted to go to school.

His reaction was immediate. He said, "I didn't even know you wanted to go. We will add you to the list." Dorland, of course, was upset about that. But then somebody on the list said he didn't want to go. So then Dorland could nominate me to replace the guy that dropped out.

Q: Did you know by then that you wanted to go into physics?

A: Yes. The concept of that program was that we would study half engineering and half physics. Most of us went with the idea that we'd get our degrees in civil engineering, but that we would have a lot of physics. After I reached MIT [Massachusetts Institute of Technology], they looked at my course work after the first summer and said that they wanted me to become a candidate for a doctorate in physics.

That raised my sights. I hadn't really seriously considered it up to that point. I took their initial exam, the qualifying exam for the doctoral program. That was a written exam. It was extraordinarily tough and I didn't think I had done well. But evidently I did quite well, by their standards.

I think it was a test with so many tough problems that you weren't supposed to get more than half of them. I'm not sure how they graded it. But they were very pleased with the results of my exam. Then they had to go back to the Army because they wanted me to stay longer than the allotted time. That got into the Office of the Chief of Engineers. Most of the people there were against it. I told my father that I heard that they were going to recommend against it. [Lieutenant] General [Lewis A.] Pick was the Chief of Engineers. My father went down to see him and asked him if he would let me do this, and he did.

General Wheeler was involved in an earlier decision about this schooling. General Groves had started the program. His concept was that we would study half civil engineering and half nuclear physics. In that way the Army would have people who were qualified to grow with the nuclear weapons program and fulfill the Army's portion of it.

Then Groves retired. The minute he left OCE, they looked at the fact that we were scheduled to go to school for three years, and said, "That's too long." So they wanted to kill the program.

I arranged to call on General Wheeler. I took along a couple of the other people who were in the program. We explained to him why we thought we should stick with it. That was a foregone conclusion. Wheeler had known me ever since I was a little boy. He said immediately, “The program will continue.”

The subject of my getting a Ph.D. came up about a year later. In that case, I asked my father to speak to General Pick, which he did, and Pick approved it.

General Pick might have approved it anyway, although the recommendation from the personnel people had been against it, because they didn’t believe that it took any education to be an engineer officer. There is a tendency among personnel assignment officers to think: if people are at school all the time, who is going to do the work?

Q: Who is minding the store? Sure. But being chosen for that Manhattan project is a very important thing for you.

A: That determined my career. Groves picked a lot of bright, capable people. One of the most outstanding was [Brigadier General Robert E.] Bob Mathe, who, of course, later became a district commissioner. Many on the list were very successful. [John H.] Jack Cushman out of my West Point class became a three-star general. So did Ken Cooper.

Not all of them stuck with it. Not all of them advanced. Some of them resigned and stayed out there. It was a mixed bag. But that was a very talented group.

Q: And obviously a very stimulating one to be part of.

A: Yes. That’s right.

Q: You know, one of the questions I was going to ask you when we got to 1948 and you are going back to school was, you know, so far you have been four years on active duty. You have met a lot of older officers, and who were important to you as role models. But I don’t think I need to ask that question any more, because apparently you have been associated with these people since you were a child.

A: Right. I did mention Bob MacDonnell was my boss in Japan. I had a great deal of respect for him. There was also a man named Ellsworth, who was a colonel at the time. I don’t think he stayed on in the Army. He was called “Memo Bill” because he was always writing notes. He was MacDonnell’s predecessor in the Eighth Army Construction Division. I learned a lot from him about work standards.

MacDonnell’s immediate superior, the Eighth Army engineer, was [Colonel Reginald L.] Reggie “Goddamn” Dean—a nickname he got from his frequent use of the

expression. I remember him. But I didn't have as much direct contact with him. MacDonnell was my immediate boss for quite a bit of the time.

While I admired Dorland a great deal at first, I didn't admire the way he handled some of his personnel problems. I thought he could have been more straightforward with us.

I know differently now, but in those days I was kind of dense. The subtle efforts of these people—they expected you to get the idea—didn't work. If I thought something ought to be done, I pursued it and wasn't deterred by subtle hints. If they said, "Don't do this," I wouldn't have done it. But I wasn't steered aside by vague behavior.

The fact that my boss was not enthusiastic about something didn't deter me from pursuing it. As I got older, though, I learned to read these signals. In those early years, I didn't do that.

Q: When you were going to school, did you have a feeling then that this was a critical time? That your career was going to go in directions that were not—you wanted to be an Army engineer. You wanted to do military engineering. But getting into this field, did it seem to you that it was going to take you away from that?

A: We thought we could do both. We could do both.

Now, let me say this: perhaps it would have taken me away from civil works.

Q: And it sort of did, didn't it?

A: It did. But this is another example of something to which I referred earlier. The strength of the Corps is in having capable people and giving them something to do besides "squads right."

This was another example of that. This nuclear weapons work was a lot more challenging intellectually than being a platoon leader or an assistant S-3 in an engineer battalion.

I don't want to short the challenges of troop duty and troop leading. But they don't develop your larger capabilities. I think you can learn all you need to know at the various troop levels in a relatively short length of time. Certainly, that was the way my close associates and I felt.

The Army has changed a little bit. There is more emphasis today on the ramifications of troop leading, and they are trying to achieve a higher standard.

We all wanted to have these opportunities, although I never did command a company as things developed. But we didn't think it took very long to learn how to be a platoon leader or to learn how to be a company commander. We wanted to be able to do all the other fascinating things as well. We all thought we would.

In many cases the nuclear assignments substituted for being a resident engineer on some civil works project.

Q: That's what it turned out to be.

A: In my case, and I think in the case of quite a few other people in this same program.

Q: Does getting an advanced degree like this put you in a position where others look at you as sort of an egghead or some kind of an eccentric?

Supreme Headquarters Allied Powers, Europe, 1951–1954

A: I don't believe so. Some have done this, but I think that is a question of your personality.

Q: When you finished at MIT, you went to Europe again?

A: Yes. This was a little bit of a *non sequitur*, but NATO [North Atlantic Treaty Organization] had become very prominent.

I received word that they were planning to send me back to Sandia Base, where I had been before going to school. When I investigated what was going on there, I found out that, whereas I had been the S-3 of this engineer battalion when I left, that job was now filled by a lieutenant colonel, and I would be put in at the bottom layer. All the jobs that we had held as majors and captains in the early days were now being held by colonels and lieutenant colonels. I was not going to learn anything that way. There was no future in that.

[Lieutenant] General [Thomas B.] Larkin was the Army G-4 [deputy chief of staff, logistics]. He was another great friend of my father's. I went to see him and said that I would like an opportunity to go to SHAPE [Supreme Headquarters Allied Powers, Europe] if that could be arranged. He sent an inquiry to SHAPE and got me put on orders to SHAPE.

There was grouching that this had nothing to do with my nuclear training, which was true. But when the top guys decided they wanted to do it, the training didn't matter.

Q: What did you think about Korea at the time?

A: It's funny. I didn't think about it. Nancy and I were married in May of 1951, and that refocused my attention. I don't know what I would have thought about if that hadn't occurred. But I didn't think about dropping everything and going to the war in Korea.



Major and Mrs. Graves in Paris, 1952.

Q: Your father was still alive in 1951.

A: He was still alive. He certainly knew that I was going to SHAPE. I don't remember that he advised me one way or the other at that stage on what to do. I didn't have the same interest in the Korean War that I had had in World War II. Certainly an important consideration was not wanting to be separated from my new wife.

Q: You were also seven years older.

A: Yes. When I looked around for things that would be interesting and challenging, the SHAPE thing came up. So I asked General Larkin to intervene to give me that assignment.

Q: So you went over there together?

A: So we went. Actually, we didn't go on the plane together because you had to go and get housing established. So I went and then Nancy came a little while afterward.

Q: You were there for three years. That's a long tour.

A: I was there for three years. The first year I was in the Office of the Special Assistant to the Chief of Staff, who was General Cortlandt Van Rensselaer Schuyler. I was the assistant exec in there. That was an administrative job. I didn't do much substantive work there.

Then I was reassigned to the Logistics Division in the Infrastructure Branch. General C. Rodney Smith, then a colonel, was the head of that branch. He was later the Deputy Chief of Engineers for Military Operations. I worked on the airfield program.

Q: So you are getting back into construction.

A: That was very much construction, although at a fairly high level. It was programming. SHAPE put together what airfields we wanted the NATO countries to build or improve.

Q: A little bit like what you were doing in Japan?

A: Yes. But at a much higher level. Every year they prepared an airfield program. I was involved with the third slice, which was the biggest single airfield program.

The biggest thing I did was the airfield standards—a list of the operational facilities that would be cost-shared in the airfield. These included the runway, the parallel taxiway, the dispersal areas, the lighting, et cetera. There was a list of about 20 items. They had agreed at the Lisbon meeting of the NATO council that these items on the field would be cost-shared. The countries would contribute to the construction costs in accordance with shares based on their economic ability to pay. The listed features of the airfield would be paid for from this common fund.

Everything else would be paid for by the host country, or the using country. Barracks and other living facilities would not be paid for on a shared basis.

However, the list of facilities agreed at Lisbon was very poorly defined. It took us almost six months to go through and define what was required for each feature—for example, how long the runway would be, how wide it would be, what bearing capacity it would have, what the clearances would be, and so forth.

Then we had a huge conference. It was big for a working meeting. There must have been at least 200 people around a hollow rectangular table. We asked representatives from every country to come for the purpose of agreeing to the refined standards. The bare bones list of the standards had been included in some document that the defense ministers had agreed on at Lisbon. But then, when it came time to implement the program, the issue was, “What does this bare bones list mean?”

There had been interminable arguments. SHAPE wanted to establish a standard that would fulfill its military requirements. I will give you an example of the kind of issue.

There were formulas to lengthen the runway based on average temperature and altitude. The standard was an 8,000-foot runway at sea level and 70 degrees Fahrenheit. What happens if you go into Turkey and you are up at 5,000 feet and the temperature in the summer is at 100 degrees. The runway has to be a hell of a lot longer. In fact, there is one out there that is 11,000 feet long because for the F-84 to get off the runway in summer, it had to be longer.

I put this document together—wrote almost all of it—and learned a lot about airfields in the process.

Q: And that is something that you came back to later on.

A: Yes. That's right. When I became involved with the Israeli air bases, I had been there before.

Q: You stayed with that for the rest of your tour there?

A: Yes. I was in infrastructure for two years, working on the airfield program. My immediate boss was an Air Force colonel named [Major General Joseph E.] Joe Gill, and his boss was Rodney Smith.

Q: This wasn't a normal Corps–Air Force customer construction agent—

A: No. All that was done somewhere down the line. This was a combined headquarters where we put together what the program would be. We resolved these issues of the standards. We dealt with one other thing called the deviations from standards.

For example, the French had a runway. Off the end of the runway, fairly near the axis, not right on it, was a church. The basic agreement was that the infrastructure funds would pay for these airfields only if they met standards. The French brought in a letter saying that this church was built in 1382 or some such date, and they could not consider moving or destroying the steeple. Will you approve a deviation from the runway approach standard?

We argued for months and finally approved it because the senior officers decided they couldn't tough it out. The pilots were fit to be tied. Perhaps in clear weather it was one thing, acceptable. But can you imagine trying to land in bad weather with this church steeple sticking up in the glide path? There was a lot of that.

Q: Were the French the toughest to deal with, in general?

A: Oh, yes. In those days, of all the people in the headquarters, they were the ones that seemed to line up with national views. There were some real exceptions. I can remember a man named Roger Nortier, a Frenchman who was very international in his approach. He was a French Air Force pilot with whom I worked very closely on the standards. But most of the senior French officers, the French generals, were looking out for the interests of France—much more so than it appeared to us in the case of the other nationals.

Q: Because that is something that has continued on through—

A: I think it is epitomized by their withdrawal, the fact that DeGaulle took them out of SHAPE.

Q: It seems to me you came back to a pretty prosaic kind of a job from—

A: Yes and no, because the challenges in SHAPE were different. The technical challenges weren't there, but the whole matter of the international relations and how you conduct affairs on a combined staff where you have all these different nationalities—but that was a challenge with great political ramifications.

Eisenhower was there when I was first there. [General Alfred M.] Gruenther was the chief of staff. I was given the job during that first year of setting up the arrangements for a visit by Vannevar Bush. There was another group of scientists led by Oppenheimer that came over to tell Eisenhower how to win the war in Europe. I was involved with the arrangements for them, too. This was when I was in the administrative job, the first year that I was there.

Q: Of course, Eisenhower didn't stay there.

A: He left, that's right.

Q: Went to the White House.

A: He came back to run for President. But he was there the first few months I was there. I made the mistake—I think it was for the Bush visit, but it may have been for another visitor—of trying to include lunch with General Eisenhower. I went around to his office. His exec said most emphatically, “No.” He never stayed at the office past noon. Probably went out and played golf.

The exec let me know—I was a major at the time—that I certainly didn't know very much if I thought that I could presume on Eisenhower's time to meet with Vannevar Bush any time after noon.

Q: Well, he must have had things under control if he could play golf everyday.

A: He was a titular head. Gruenther did all the work. Gruenther was the one who organized the whole thing. They got Eisenhower to make the contacts. But the brains behind SHAPE were Gruenther's brains. He was a brilliant guy and he pulled all the levers to make the thing work.

Nuclear Power Program, 1955–1957

Q: Were you happy to get back into nuclear power?

A: Yes. [Lieutenant General James B.] Jim Lampert, who was in charge of the Army nuclear power program, was one of my role models for all my life. My immediate boss was [Colonel Joseph A.] Joe Bacci, who was in charge of the Nuclear Power Branch in the Engineer Research and Development Laboratories. The purpose of that branch was to build the nuclear power plant at Belvoir—the APPR [Army package power reactor].

Q: Bacci worked at Canaveral District later on? Same guy?

A: Yes. He was a very experienced construction man, and his main job was the construction of the nuclear power plant at Belvoir. I was in charge of the training section. My job involved two things: one was to put together the crew for this plant, and the whole program for training crews.

Q: The plant was at Belvoir?

A: The plant was at Belvoir. It's still down there. You can go down and see it.

Q: I guess I ought to.

A: You might be interested. The last I knew, it had been set up as a museum. It's down behind the labs, on the water at Gunston Cove. It used to be that you did not have to go through the lab to get to it, but they may have changed the security fence.

One job was to put together the crew. The other job was to put together a graduate education program.

My idea was to pattern this on the same concept Groves used—to have a combined program: civil engineering and nuclear engineering. I went to all the universities with

strength in these two areas to ask them to offer such a program for engineer officers. I ran into all kinds of problems.

I flew all the way out to Caltech, flew on the red eye all night—that was before the time of jets—spent the day with them, and then flew all night the following night. But I couldn't persuade them to do it.

Q: Why?

A: They said that their ideas on nuclear engineering had not matured sufficiently. They had no courses that were called nuclear engineering at that particular time. That would have been 1955, probably. They had courses in materials and physics and so forth, but they did not have a nuclear engineering program. I tried to persuade them that they ought to have one, and that I would be glad to send an Army officer to it.

The other problem was they had just abandoned summer classes. They had had them, of course, but they had abandoned the idea of having any course work in the summer.

They were very polite, and we had Army officers there studying civil engineering. That was no problem. The problem was they weren't ready to offer the kind of curriculum I was looking for, lasting probably 18 months and including possibly two summers.

Q: Did you ever find a place that was willing?

A: Yes. MIT was no problem. They already had the courses. Princeton did it. The University of Michigan did it. The University of Illinois did it. We had these programs, and we got some terrific men into them.

Q: Did you pick them?

A: By and large, yes. We would go over who were the guys that were academically talented and had good military records. Then we would make contact with them and try to persuade them to volunteer for this type of schooling.

Q: When you were at Eniwetok, was that the Sandstone series of tests?

A: Yes. That was the first nuclear series they did at Eniwetok. There were three tests. [Lieutenant] General [John S.] Hull was the task force commander. At the time, if I remember correctly, he was a lieutenant general. The task force had four ships. The flagship was the *McKinley*, a Navy command ship. Two ships, the *Albemarle* and the *Curtis*, were former seaplane tenders that had been converted specifically to support nuclear test operations. The fourth ship was the *Byroko*, a baby flattop.

The *Curtis*, in particular, had been modified to have all the assembly facilities for the weapons, including an area for high explosive assembly, an area for nuclear assembly, and shops to test all the electronics.

These ships sailed out of Long Beach. I was at Los Alamos at the time. We took the train from Santa Fe and had an interesting experience.

We couriered the nuclear components for the weapons from Los Alamos down to the Santa Fe station by car, then by train from there to Los Angeles, and then onto the ships.

I was one of the keepers of these weapons. The nuclear components were sealed in aluminum containers in an atmosphere of argon gas. This was to protect the plutonium against corrosion. It's a very reactive metal. Each plutonium hemisphere was plated with nickel to seal it from the air.

But to guard against any possible danger to the plutonium parts, they were sealed in argon gas. We monitored the pressure of the gas and the temperature of the metal container to make sure that things were normal. The pressure was mainly to make sure that the gas had not leaked out because they didn't want any risk that any plutonium would contaminate anything. So as long as the argon gas pressure was constant, you knew that it was hermetically sealed.

The temperature would tell you if there was some chemical reaction or something going on in there, or even a nuclear reaction, although that would have been very unlikely. There is a certain amount of low-level radioactivity from this thing.

Well, in any event, they put with each of these cores somebody who was familiar with the core, and that person or his relief had to stay with it all the time.

Q: How big was the package?

A: The package was about 8 by 8 inches and about 24 inches long. It was a rectangular aluminum container.

This is an amusing story. We put this aluminum container in a normal footlocker, an Army footlocker, and drove down to the train stop. There were myself, one other of our group, and two security men from Los Alamos. We were all in civilian clothes. For the trip from Santa Fe to Los Angeles, they had reserved a private compartment for us.

We were standing there waiting for the train to come. The station isn't right in Santa Fe. It is a few miles away. The train came up the Santa Fe railroad and stopped, and the

porter came down out of the Pullman car. He looked at us and asked if he could help us with our luggage. We said yes, but we would carry the footlocker.

And he said, "I'll bet you've got an atomic bomb in there." Well, nobody said anything, and that guy's eyes got bigger and bigger and bigger. He realized that we might have an atomic bomb in there. I don't know that he was frightened, but he was really surprised.

Q: That is very funny.

A: That is a funny story.

Q: Well, how does it feel, traveling with an atomic bomb?

A: We had worked with it so much we weren't worried. We wanted to be sure about the argon and the heat. The plutonium is radioactive. It is continually emitting alpha particles. They don't go anywhere. They just stay right there. They are heavy compared to other radiation. And the nickel kept them in.

But the radioactive decay generated heat all the time, and the container had to be set where it would cool. In the footlocker, it was next to metal, and that tended to carry the heat away. When we got it aboard ship, we set it right on the metal deck of the ship and by that mechanism, the heat would be carried away.

But the aluminum case was warm to feel as a result of the radioactivity in the core. There was no danger from this radioactivity, but it was going on. That was one of the reasons for having a thermometer to read the temperature.

There were maybe a dozen of us who had to sleep with these things all the time. We had a plan in case the ship sank. We had a buoy on the deck right outside the stateroom. We were to attach the aluminum container to this big buoy so that it would float. The buoy was painted bright orange, and it could be recovered. The United States didn't have very much plutonium in those days, and these things were invaluable.

I don't know what amount of money it might have cost to produce them, but that wasn't the issue. The issue was we didn't have very much.

We stayed with these. We had two cores for each of the three tests. So there were six out there. They had them distributed around, and somebody was staying with each of them the whole way. I wasn't doing that the whole time, but I spent a lot of time at it.

As time went on they let us go out of the room. But while we were in transit, we practically never left the room where these things were located. Maybe to go down to meals. But other than that we stayed in the room with them—just in case—not so much that anything would happen to this in an emergency, but that if there was any kind of an emergency on board ship, they wanted somebody right there to deal with the core.

Q: On the train the biggest concern would have been a train wreck, a derailment of some kind.

A: That's right.

Q: So what ship did you sail on?

A: I sailed on the *McKinley*, which was the command ship.

Q: And there were 12 of you from Los Alamos?

A: There were about 12 from Los Alamos. There were a whole lot more that went from Sandia Base in Albuquerque.

The whole task force was big. It sailed under blackout conditions. I believe they had intelligence; they detected Soviet submarines.

The ships sailed in a convoy, with some destroyers escorting it, and all ships blacked out. We stopped very briefly in Honolulu, maybe a day or two, and then went on to Eniwetok.

Q: Did you see the tests?

A: Oh, yes. We saw all three of the tests. The tests were conducted on the northernmost island of the atoll, which is roughly oval. Eniwetok is the largest island and is at the southern end. It's in the quadrant from maybe four to six o'clock, looking at it clockwise. The tests were on an island up north that would have been between twelve and one o'clock.

They were on towers. I was involved with the assembly of the second of the three weapons that were fired. There were effects tests done, and for the tests that I wasn't on the assembly team, I worked on some of these effects tests. They measured the blast, the heat, and the nuclear radiation that came out of the weapons.

Q: With instruments?

A: With instruments. One of the ways that you measured radioactivity in those days was to put out samples of material which would be activated by neutrons. Then you measured the activation of the material and based on that level, compared to a standard sample, you could then calculate the integrated dose on that sample. We put out these chains of these samples on wire rope. When the test was over, the samples were pulled to a safe distance with a truck. Since the test was on a tower, the area close to the test was too radioactive to enter immediately. The samples had to be recovered fairly quickly before the “induced radioactivity” in them decayed too much. We were involved in days of counting these samples to gather the data and analyze how intense the radiation had been at various distances from the weapon.

Q: Did you witness it—aboard the ship, I suppose.

A: Yes. Some of the ships moved up near the test island when we were getting ready. Then, when everything was in readiness, all the ships moved down to the southern portion of the atoll. You can’t see the northernmost islands from the south. It is almost 25 miles from north to south so there was no problem with getting far enough away for the size test we were doing.

But you could see the test clearly. They were like what you have seen on television or in the movies many, many times. You don’t look directly at the test because there is high intensity light and radiation right at the time of the test. That can be damaging to your eyes if you are looking at the weapon. You can look at it indirectly in a mirror or through some heavy glass that shields out the radiation.

Q: Was this the first time you had actually seen a test?

A: Yes. We had seen movies taken of the Alamogordo shot, of course. And there were quite a few movies taken of the Bikini shots.

Subsequent to those tests they improved the test procedures. The Alamogordo shot had been on a relatively low tower. These tests were on higher towers. That had to do largely with getting the devices up in the air enough so they could make better measurements on things like the fireball to improve the measurement of the efficiency of the weapon. One of the ways they did that was by measuring the rate at which the fireball grows in the first fractions of a second. They had very high speed cameras that would take pictures. The rate at which the fireball grows is a function of the energy of the weapon. Analyzing those pictures was one of the ways they had of determining the weapon yield.

There is a whole series of ways of measuring efficiency. In those tests, one of the important things they were doing was to try all these different methods to see which

was most reliable. The most reliable method of all is by radio-chemical analysis of the debris. They had planes that flew through the cloud and sampled the cloud after the test. Then those radio-chemical samples could be analyzed.

Knowing the relative quantities of the residual plutonium and the various fission products would even today be the most precise method. But that takes a long time, and they wanted a lot of different techniques to develop their ability to determine the efficiency of the weapons.

Q: You weren't involved in the development of the test series? You were just involved in the bomb assembly?

A: Well, I had a minor role as far as preparing for it. I helped to prepare some of the drawings for the nuclear core. At Los Alamos they were short of people to prepare the drawings for the machine shop, and I worked for a short time as a mechanical draftsman.

But no, I wasn't really involved with developing the plans. I was familiar with the plans, and on the way home I got involved with preparing the report. Then Captain, later Admiral, [J. S.] Russell, was the test director, and I was assigned to his staff and helped to write the test report.

I remember that we had to write messages for him. I had not written very many messages up to then, so I just wrote the messages in ordinary English. When I took it to him, he looked at it and he said, "Where did you get all this Army jargon?" He proceeded to rewrite it and put in phrases like "below decks," "belay that," and all these Navy terms, and he said, "Now there's a true joint message."

Q: Is it hard to maintain your scientific or analytical detachment from an experience like this?

A: No. You see, that's the difference between the way people feel about weapons today and the way they did then. We perhaps didn't appreciate all the ramifications of nuclear weapons, but there were really two things. We were military men. We thought these were the weapons of the future. Granted, they were much more capable than the weapons of the past, but you know, we had expended millions of tons of bombs in the war, and I had seen Tokyo and Yokohama after the war.

You asked me whether I had been to Hiroshima or Nagasaki. No. I had been to Tokyo and Yokohama, and they were just as flat as Hiroshima and Nagasaki. The whole town was gone. There were a few surviving buildings. This had been due to fire bombing. We

did incendiary bombing, and most of the residences were wood and the whole place was burnt out. There was city block after city block that was nothing.

Q: That is an important point.

A: These weapons were more capable, but I think, by and large, we did not feel that they were going to be any more destructive—just that we were going to be able to do it with less effort than had been the case in World War II.

That's the first point. The second point is that we became quite knowledgeable about all the effects of nuclear weapons, the safety procedures, and all that, so we didn't have some hidden awe of radioactivity as a mysterious force that we didn't quite know. We knew the dangers, particularly in working where we did in the nuclear assembly building, which was called the ice house, because it had been an ice house at Los Alamos before the government arrived. They had taken the old ice house and converted it into a room where they assembled the nuclear components.

We worked with plutonium. Plutonium is a very dangerous substance on two grounds. One, it is a heavy metal and heavy metals are very poisonous. Second, it is an alpha emitter, and it is not eliminated from the body very rapidly if you take some in. Also, it is very reactive chemically.

We knew that we had to take great care not to take in any plutonium. You wore rubber gloves and you didn't smoke or eat or do anything in this room. When you got through working in this room, you cleaned up. You never put your hands or anything near your face because you didn't want to run the risk that if you had gotten plutonium on them, you would take it into your body. They had dosimeters and urinalysis and things like that to check whether or not anybody had gotten any.

Q: So you were extremely cautious.

A: We were very careful. This has been a big issue in the nuclear industry. You continue to read a lot about the woman who worked for Kerr-McGee and was killed in an automobile accident.

Q: Karen Silkwood?

A: Karen Silkwood. Most of our group, certainly I, think nothing of that. We think that was a put-up job from the word go.

Q: What do you mean?

A: We think she probably stole some plutonium. There is some evidence that she contaminated her urine samples. She may, because she didn't know what she was doing, have hurt herself—perhaps contaminated herself.

The typical person who has worked in this industry views this as a conspiracy by Karen Silkwood and whomever to discredit Kerr-McGee. I have gone into this a little bit to illustrate that we were very familiar with it so it didn't awe us. It was our view that, as we became more knowledgeable, that these weapons would be integrated into our military capability and the peaceful uses of nuclear energy would be integrated into our economy. And there was great opportunity. In those days there was tremendous optimism about the peaceful uses of nuclear energy.

Q: In the 1940s even?

A: Yes. The minute the Smyth report was published, the popular wave was that we were going to benefit tremendously from this. It is a very interesting evolution—sort of beyond our interview—how we came from that optimism to the present negative view of this all around the world.

In a nutshell, two things happened. The most important was that the people who were opposed to nuclear weapons and were concerned with them did everything they could to link in the public's mind the dangers of nuclear weapons with the dangers of civilian use.

The other was that it was mysterious, and the job of educating people and having people become familiar with this wasn't done. The whole question of radiation and all that—people didn't learn about it. One of the ideas was that the children in elementary school would learn about nuclear energy, and by the time they became adults, they would be familiar with it, and it wouldn't be a mystery to them.

Q: It would be like computers. Everybody is literate.

A: Right. Everybody thinks they are great.

Well, there was a synergism between these two factors, since people that were opposed to nuclear weapons wanted the public to make this linkage. The whole process of educating people was not, "Look, learn about this because it is going to be a great benefit." It was, "Learn about this because it is the biggest danger in your life." If you look at that process over a period of 40 years, we have been educated away from this rather than toward it.

It is very much like what the British did about poison gas in World War I. The Germans caught them flat-footed. The Germans had chlorine, and they really decimated the British. And the British looked around. They had no gas masks, they had no chlorine, they had nothing. And they said, “What can we do?”

They decided that the best thing they could do would be to start a propaganda campaign that would discredit the Germans. And they were successful. It was a sort of a pilot effort, and the result of this was that we came out of World War I with a violent or extreme public antipathy to chemical warfare, which has remained.

And perhaps justified. I am really not passing on the merits of this. I am talking about the dynamics of it. Exactly the same thing has happened with nuclear weapons.

Q: Well, in the case of nuclear weapons do you think this turn of events is unfortunate?

A: It is one of those things where who knows? I think it is very unfortunate as far as nuclear power is concerned. My personal opinion is we have made a huge mistake, that we have denied ourselves perhaps what would have been, if it had been done right, the cheapest, cleanest, safest power we could have. We wouldn't have been killing hundreds of coal miners every year. We wouldn't have been polluting the air and causing God knows how many cases of cancer a year and so forth and so on. All the adverse effects of fossil fuels on mankind.

Q: Which we don't talk about very much.

A: We don't talk about, but I am sure that if you did an objective analysis, you would find that mankind has suffered and will suffer far more damage from the continued use of fossil fuels than it ever would have if we had gone more extensively to nuclear power. But it is true that the nuclear industry has not done a good job.

The government people running it, and the industry combined, did a very poor job of regulating it and educating the public, and there was extraordinary mismanagement in the building of these plants, exemplified by the failure out in the state of Washington. The public power entity in Washington had a very large plan to build nuclear power plants in that state. Basically what happened was that due to mismanagement they went bankrupt. They didn't complete the plants in the time that they were supposed to and there were huge cost overruns. The net effect of this was that they reached the point where they had to make a decision and they decided to abandon the whole program. All these state and municipal bonds went in default.

It is true that the environmental opposition to these plants—there was a link between the environmental opposition and the opposition to nuclear weapons—this opposition

erected a lot of legal and bureaucratic obstacles to the program. That's a factor that can't be totally discounted.

But I also think that the people in government and the people in industry that were running it didn't rise to the challenge. The culmination was that nuclear power has been discredited. I think it is human mismanagement that technology offered something here which the United States, at least, hasn't done well with.

You look on the continent of Europe and the French are doing very well with this. They have handled it differently from us. It was more critical to them because they didn't have a fossil fuel option.

Q: That's right.

A: There was more single-mindedness on the part of the government and on the part of industry there to make it succeed. And perhaps the people, as well, knowing they didn't have a fossil fuel option, were more willing to accept the risk, if there was any. I don't think there was much, frankly.

Q: You mentioned the environmental opposition. Of course, that comes later in the 1960s and the 1970s.

A: There was no environmental opposition worth mentioning in the late 1940s and the 1950s.

Q: There was a consensus—

A: In my view, remembering those days, there was a national consensus that this was positive.

Q: Do you suppose this lulled people who made policy into complacency?

A: Very much. I also think—this is critical of him, but others have criticized him—that the tenure of Glenn Seaborg as chairman of the Atomic Energy Commission [AEC] was unfortunate. He was a brilliant man, and he had made very important contributions to nuclear energy as a nuclear chemist. But he was not an able administrator. He was not an able formulator of public policy. The country needed the guiding hand of somebody with more vision and experience in public policy during that formative period. We lost that period. That was the 1960s. He held that office for seven years during the Kennedy and Johnson administrations.

Q: A critical period.

A: It was a critical period. You are now reading a lot about the fact that the public was misled in one way or another. A great deal of that occurred in Seaborg's administration. Maybe anybody would have made those mistakes, but certainly when you look at his background, and you talk to people involved in the program during that time, you get the distinct impression that he was not the leader that was needed.

He wasn't of the stature of some of the people that went before him—David Lilienthal, for example, who was the first chairman, and others.

Q: That takes care of what I was going to ask you. I don't know if there was something else that you think you ought to add about that—

A: Well, I think perhaps we ought to move on to some other areas. After we have finished them, if we want to come back, I could go into other interesting stories about the nuclear program. First, we ought to cover your agenda.

Q: Okay. As you obviously have seen by now, I don't always know the questions. But one thing that you mentioned that I had never heard, in your tour at SHAPE, was this concept of the third slice in the air base program. I don't understand that.

A: I think this may have come from the French. The French word for slice is *tranche* and this was the concept of the annual increment. They are now up to a much higher number.

Q: Oh, I see. It wasn't a geographical concept. Or anything like that.

A: No, it was a time concept. The first slice dated back to the Western European union. The second was the next year. The third slice was the big slice that was agreed upon at the meeting in Lisbon. That took place early in 1952. At this meeting the foreign ministers and the ministers of defense agreed that the annual program to which everybody would contribute would include a certain number of airfields and so forth.

Q: Okay. You've mentioned two people frequently. Bob MacDonnell, who I guess is your neighbor here in Arlington.

A: Bob MacDonnell died here this year.

Q: No, I didn't know that.

A: He was the head of the Construction Division in the Engineer Section of the Headquarters of Eighth Army in 1946. He later went on to become the division engineer of the South Pacific Division in San Francisco.

Q: And president of the Mississippi River Commission, is that right?

A: Yes. That's right. His next big job that affected me was Director of Civil Works, then Deputy Chief of Engineers, and then division engineer of the Lower Mississippi Valley Division, after which he retired from the Army. After he retired, he worked for a time as a consultant on the staff of Senator [John C.] Stennis.

Q: He is listed in the West Point book as on Senate staff.

A: He was one of the senior advisers on Senator Stennis's staff. Since he retired from that position, he had been living here in Rosslyn. He died this past year.

Q: He, in a way, followed your father's footsteps, getting involved in the political end of—

A: Yes. Let me say that we have dozens of senior engineer officers who have had these jobs. The key in the civil works program is that the object is to serve the needs of the people. The way you work that problem is to be in touch with the members of Congress, who are elected to serve their constituents.

Q: You mentioned him and you mentioned General Lampert as both extremely able and admirable people. And I wanted to ask you what you based that assessment on. What made these men admirable to you?

A: They were bright, of course. But the thing I felt I had to learn about, that both of them showed me, was the way you deal with people. They thought through what needed to be done, and they knew how to make plans. But they also were very good at getting agreement on their plans. Of course, I think it is obvious that not everything in this world is simply submitting your recommendations to your superior, who then approves them, and then you do it.

There is a lot of lateral coordination that has to go on. You are forever in this world working with other people, and they were both expert at putting together plans and getting people to agree on them and working with a diverse group and making allowance for the varying needs and desires of others.

That's something I thought I had to learn about, and their pattern of conduct taught me a lot about it.

Lampert never criticized anybody unless there was a purpose behind it. He was no namby-pamby.

Q: But he didn't lose his temper.

A: He didn't lose his temper. He got mad—and you could tell when he was mad—but he never said anything. I sometimes do lose my temper. But I learned from him how to handle it.

One thing he did which I try to do, but after I had been working for him a while, I knew what it meant. If he was going to criticize you or correct you for anything, he always started out by complimenting you. When I would go in to see him, and he would start telling me what a good job I had been doing, I knew he had something that was bothering him, and he was going to go into it.

Q: You were in for it.

A: He was going to tell me. He was always very polite when he was correcting me. But I got to see the warning sign there.

I tried to use that approach as I went on and had more senior jobs. I perhaps don't do it as much as I should, but particularly when I was in troop units, I learned to do that. You get a lot more from people if they feel that their work is appreciated. You don't get the maximum effort from people simply by telling them what they are doing wrong.

Q: When I went back to the office yesterday, I had a chance to do a little research on the nuclear power program, so I could be a little bit more knowledgeable about what I was asking you. And I noticed that Lieutenant Colonel [William C.] Bill Gribble was there.

A: Right. Bill was Lampert's deputy.

Q: When you arrived.

A: When I joined the program in the summer of 1955.

Q: Was that the first time your paths crossed, yours and his?

A: That's right. I had not known Bill before. He had graduated from West Point in 1941 and, of course, was gone before I reached there. The other thing—he had been in Los Alamos, but our paths had not crossed at that time.

Q: Yes. He had been there.

A: I first met him when he was working for Lampert. He was a lieutenant colonel and Lampert was a full colonel.

Q: And later on, he was Chief when you were in civil works, is that right?

A: That's right. He played a very substantial role in that because at the time I was the Director of Military Application in the Energy Research and Development Administration [ERDA], which was the successor to the Atomic Energy Commission.

I was working for [Lieutenant General Alfred] Dodd Starbird, who is another one of my role models. Starbird, if you were a good man, never let you leave. Gribble wanted me to be the Director of Civil Works. I had talked with him some when he had been the Chief of Research and Development of the Army about coming to work for him. I was interested in that.

He moved from that research and development job to be Chief, and he kept in mind that I was interested in coming to work for him. He proposed to Starbird that Starbird release me from the Director of Military Application to become Director of Civil Works, and Starbird basically was stalling. He didn't want to say no, but he didn't say yes.

I finally told Starbird that I felt my job as the Director of Military Application was a dead end as far as my Army career was concerned and that among other things, he might not have realized I was much more senior at the time I was in the job than he had been when he had held the job. He had held the job back in the late 1950s, relatively much earlier in his career. He had been, when he went to it, only a colonel and was promoted to brigadier general as he arrived on the job. He stayed with it for almost five years.

When I was assigned in there, I was already a major general. So I was much later in my career. My feeling was that, in terms of the advancement of my contemporaries, if I was going on to any more senior positions, I had to get back with the Army. I wouldn't be able to move up from ERDA.

[Lieutenant General Joseph K.] Joe Bratton took my place working for Starbird, and worked there for four years. He became Chief of Engineers. He was extraordinarily well fitted for the job. But he was running out of time when he finally escaped from Starbird and became division engineer of the South Atlantic Division. Joe did an outstanding job in DMA [Division of Military Application], and Starbird wouldn't let him go, either.

Q: When you met Lieutenant Colonel Gribble in 1955, this optimistic consensus about nuclear power obviously still held.

A: That's right. Very much so. And I will give you an illustration of it. This was a thing that did not work out technically. They had come out with the concept that they could have what they called package power reactors. That is, they could make a small plant which could be carried to remote places and could function easily and would obviate

the resupply of fuel, which, at the time of the DEW [distant early warning] line and all the other installations up in the north, was a very heavy burden. They could only be resupplied in the summer. The summer months were short, and the whole logistic thing was very costly.

Because it was economic rather than military, they adopted a different philosophy from [Admiral Hyman G.] Rickover's program.

As far as Rickover was concerned, performance and safety were important, and it didn't really matter what power plants cost. I don't mean that he was profligate, but he never hesitated to spend money if it was important as far as the operational efficiency or the safety of the propulsion plants for the nuclear submarines. He lavished money on the technology to get the best product.

By the time Lampert and Gribble got going on nuclear power, their attitude was that they had to demonstrate almost from the beginning that the plant was going to be economic. Among other things, they advertised for competitive bids and awarded to the lowest bidder the contract for the development of the plant at Belvoir.

Q: I hate to interrupt you, but is that a civil works syndrome? Is that the cost-benefit ratio?

A: Yes. I think they reflected the attitude of the Corps that you get qualified bidders and then you get the best price you can by going to the lowest bidder. I agree with that if you have technology in hand.

However, when there are technological problems, a fixed-price contract awarded to the lowest bidder can be a mistake. In this case, there was some problem, but not a serious one, because there were not as many technical uncertainties in that plant as there were in some others. The type of fuel rods was new. They went to a stainless steel clad fuel rod. Rickover had been using titanium cladding on his rods. The Army went to stainless steel, on which most of the development work had been done at the Oak Ridge National Laboratory [Tennessee]. That turned out OK. Where it broke down was that the controls were too complicated for that type of plant.

The contractor had a mixture of every conceivable type of instrument—air operated instruments, electrical instruments, electronic instruments. The instrumentation control panel was a monster. As the person in charge of operations and training, I had to come up with a crew for this plant.

We had to have two people on each shift, and we had all these different maintenance specialties. As I recall, the crew to operate this plant ended up being 18 to 20 people. That didn't compete well with a diesel engine, where you could hire one guy, and he

could go in and check the oil level in the morning and look at it again at night. Here we were: we could save on transportation of fuel, but we required a big crew.

The point of all this is the following: we never came up with a package power plant that was just a package that you could pick up and put somewhere and it would run itself.

Q: The Belvoir plant was initially named optimistically APPR-1.

A: That's right, and that was the goal. I think two things: one, the approach to the program didn't focus enough on the amount of development that would have been needed to achieve a true package plant. It was done on the cheap; maybe that's all the money they had. But they were also trying to demonstrate economy, don't forget.

Second, the technology was never there. One of the things they were counting on was that the aircraft nuclear propulsion program was spending millions. There was a feeling among all of us that we would get all the spinoffs from that. If they could make a plant that would go on an airplane, we would get all that technology, all the development on the fuel, the development on the operating system, the instrumentation, and it would be very easy to adapt that to the package plant.

The aircraft nuclear propulsion program was a bust. It was not a good idea, and they finally woke up to the fact and stopped spending money on it. So that source of unlimited R&D [research and development] went away.

The other thing is I don't think the technology was there. If you look at the trend in the nuclear industry, they have gone to very big plants because only in a big installation can you afford all the complex instruments that are necessary to make sure the thing functions. If you have a huge plant, then all this instrumentation doesn't represent a large fraction of the cost. If you have a small plant, you still have to have all these instruments, and it becomes a very large factor in the cost of the thing.

It didn't pan out. The technology wasn't there. I remember having a considerable argument with Bill Gribble about this. I kept saying they weren't spending enough money on this. He kept saying that I had inflated the personnel numbers, that I was requiring too many different people. I said, "Well, I am not requiring any more different people than any civilian power plant has. They have all these people. If you are going to put them all up at the end of nowhere in Alaska where nobody can get there for nine months, you are going to have to have them on the site because if something goes wrong, and you are relying on this plant, you are going to have to have somebody there to fix it."

The basic problem was they couldn't come up with a design that didn't require all these people to be around to fix it.

Q: What was this company named ALCO that—

A: Yes. The American Locomotive Company.

Q: Is that a subsidiary of General Electric?

A: No. It was up there in Schenectady, but it was completely separate—it was the second locomotive company. Of course, if you go back, you had Baldwin and others that made steam locomotives. The American Locomotive Company made steam locomotives.

With the transition to diesel, you ended up with really only two companies: General Motors and ALCO. ALCO was the second one. They were still making diesel locomotives in the mid-1950s, but when the nuclear business got going, because of their background in making steam locomotives, they got involved in pressure vessels and other things of this type—pumps and so forth—related to nuclear power plants. They had been working as one of the subcontractors in Rickover's program.

Based on their considerable experience in that aspect of nuclear power, they were invited to bid on the prototype Army package power reactor. American Locomotive Company became one of the finalists in the competition.

They were trying to move from the subcontractor tier, making pressure vessels, et cetera, into the position of being a prime. So they bought in. The estimate for this plant was \$8 million, and they bid \$4 million.

Q: It was a fixed-price contract?

A: It was a fixed-price contract to build the plant and to test it. Nobody made any bones about it—ALCO was going to put up \$4 million to establish its position. There have been complaints in some of these cases where buying in was viewed as a negative. But the attitude here was not that. If industry at this early stage was willing to put up part of the money this way, that was fine. The contract was between the Atomic Energy Commission's Schenectady office and ALCO.

Q: So there was not an engineer contracting officer on it?

A: All the engineers were detailed to the Atomic Energy Commission. For example, Joe Bacci was the contracting officer's representative. His superior in the contracting hierarchy was the manager of Schenectady operations of the Atomic Energy

Commission, who was a civilian. But Joe was the Atomic Energy Commission's resident engineer.

Q: I see.

A: Jim Lampert was the chief of the Army Reactors Branch in the Division of Reactor Development of the Atomic Energy Commission, as Rickover was chief of the Naval Reactors Branch. These people were all dual hatted. Lampert had a job in the Office of the Chief of Engineers, and he had a job in the Atomic Energy Commission. His office was actually located in 1717 H Street, which was the downtown office of the Atomic Energy Commission, the main office being out at Germantown.

Q: Were you involved in design and construction of what became the SM-1 [stationary, medium power] reactor, the Army's first nuclear reactor? Is that what they finally—?

A: I didn't get into that a whole lot. The minute I got on board, I started talking about all the things that are involved in the operation—but the design had been pretty well frozen. The contract had been awarded.

I remember talking to them about changing the design of the building. The building is just a nice little building built around the plant. I said we shouldn't do that. We should build the building in the form of a cross. Well, we wouldn't build the arms of the cross, but we would have the ability for the building to grow in four directions.

One direction would be on the side of the spent fuel pit, and we would use that wing to work on things related to fuel rods and spent fuel. Another direction would be where the generators were, and we would use that direction to do development work on the generators and the other conventional power plant features.

Another direction would be where the control room was, and we would use that wing to work on perfecting the instrumentation. In other words, we would have areas there where we could do R&D that would relate to the various plant functions.

My general idea was yes, we had this reactor. We were going to run a 700-hour performance test, and then the thing was going to be turned over to testing. They wanted to get a lot of hours on these fuel rods, and they wanted to do a lot of measurements.

In the fourth direction would be chemistry. In any steam plant you have to worry about the chemical content of the water. Water chemistry was an important aspect—still is in nuclear plants because the water has to be very pure so that the impurities will not become radioactive as they circulate.

What you do is keep the water very pure, and the water itself doesn't become radioactive. It is the chemicals in it that would. As the water circulates through the reactor, if there are chemicals in the water, they are irradiated and they become radioactive. Therefore, the water is radioactive.

But if you keep the water at high purity, then you don't have radioactive ions. But you can't just sit on your laurels, because in this environment all materials are eroding. Even stainless steel. As the plant continues to operate, you have chemicals going into solution in the water from the vessel walls and piping. So you have to have highly capable purification equipment, which is continuously removing these dissolved solids.

The filters become highly radioactive, and that has to be dealt with. After a certain length of time, you backwash the filters, and then you have a concentrate. You end up with radioactive waste that has to be either carted away or put out in the river or something.

They weren't going to put it in the [Potomac] river here. Already the concern for the environment was showing up. My personal view is that probably would have been the best place to put it. But we won't get into a long argument about what these low levels of radioactivity do. I think we painted ourselves into a corner on our concern over the level of radioactivity. But be that as it may—

Q: They did put a lot of that stuff into the river, didn't they, over at Gunston Cove [Virginia].

A: Maybe they did release some. They had the cooling water circulating through, but whether they were bleeding any of their low-level radioactive wastes into that I can't remember. I am sure that was an issue.

My concept was to turn this into an R&D facility for all the features of the plant—not just a test of the reactor and the test of the primary cooling loop.

Q: As well as a power plant.

A: Yes, as well as a power plant. I can't remember Lampert's view on this, but I think he was against it, and I think Gribble was against it. And [Brigadier General] Elmer Yates, who was a classmate of Bill's and took his place. None of them picked up on this idea. I wasn't trying to get credit for it. I was just trying to get one of them interested in it. They never thought it was a good idea.

If you look where the program has gone since, they saved the taxpayers a lot of money.

Q: Did you design the course for operators yourself?

A: Yes, and no. The outline of it, I did. I got Admiral Rickover to let me visit Arco, Idaho, which is where he had the prototype for the *Nautilus*. He had built a plant out there in Idaho Falls, actually, at the National Reactor Testing Station. He had set up his training course there.

He wouldn't let anybody go there because he had an absolute thing about not bothering his people. He didn't want a stream of visitors diverting the attention of his management out there from the work.

But he did let me go and I went out and saw what he had done. The course involved a lot of academic work to get people knowledgeable about nuclear matters, chemistry, steam, and so forth, although, of course, the Navy used a lot of steam. But the course included thermodynamics and all that. The second half was hands-on experience with the *Nautilus* prototype reactor.

I came back from that trip and made up the idea for our course. To get going, we decided to contract with the University of Virginia in Charlottesville. The brother of Dr. Gil Quarles, who was with the Corps of Engineers for many years as a civilian science adviser to the Chief, was the dean of engineering of the University of Virginia at Charlottesville.

We asked three schools to submit proposals—Virginia, North Carolina State, and maybe Penn State. I am not sure. Penn State and North Carolina State were very much into nuclear power education. Virginia was just starting. One great virtue of Virginia was its proximity.

In the end we picked Virginia. We sent the crew members down there in the summer, and they had about two months of purely academic work. There were two points.

First, if you were going to get enlisted men to do this, we were talking about understanding more about mathematics and more about physics and more about chemistry and more about mechanical engineering than most enlisted men in the Army knew. We weren't prepared to take just a high school graduate. We wanted a person that had had an education equivalent to having completed either a freshman or a sophomore year in college. The only way to get them there was to have this course.

When that was finished, we brought them back to Belvoir, where the plant was being built. We put them in the plant, and they started working as members of the contractor's force, because the contractor was responsible for doing the 700-hour test. What we wanted to do, which was exactly what Rickover had done—he had pioneered

how you do these things—was to have the contractor use our people to run the test. Rather than going out and hiring civilians, we would turn these people over to him. They would work for him. We would pay their salary because they were in the services.

The second point was that we would make it tri-service. We did that because the Army was building these package power reactors for use by all three services—Army, Navy, and Air Force. So we thought we ought to get them into the training program right from the beginning.

There was another reason: the Army didn't have anybody that knew anything about steam machinery and the Navy had all kinds of people that knew about steam machinery. One of our ideas was if we wanted to get people experienced in steam machinery, we got the Navy on board and they would send us people.

We got mostly warrant officers and master sergeants into this first group.

Q: You got people who were adequate to this task?

A: Oh, yes. We had no trouble. That was one of the most amazing things. I don't know whether this happens very often. But I decided to have a worldwide recruiting campaign for these people, to have all their applications and records sent in to Fort Belvoir, and we would screen them, and then we would bring them in for interviews, personal interviews.

The Army usually doesn't do anything like that at that level. It just assigns them by number. I went over to one of the temporary buildings where the Adjutant General was doing his personnel work and described to them what I wanted to do. They started going through the length of time it normally takes to prepare a circular like this. And I started talking about the timing of all these things. We spent the whole day going over this, and they came up with a much shorter schedule. They got this circular out in less than a week, and it contained all the deadlines necessary to meet the power plant schedule.

But here is the interesting thing. Nobody had told me to do this or told the Adjutant General's office to do this. I would go and see Lampert occasionally and tell him what I was up to, and he always said fine. To do all this, I didn't have to be told by him, and I didn't have to have his authority. I went all over the Pentagon and all these places and went in and told these people what I was doing. And they said, "Fine." I didn't have to go to the Chief of Staff or the Secretary of the Army, or the G-4 or anything. There was none of this business which seems to be prevalent now, that you can't even mail a letter without permission. That's true.

I don't know what it was. I just dreamed up what I wanted to do and did it. I was a major at the time, and I just figured it out and was able to do it. The thing that is amazing is the amount of cooperation I got from people.

Q: Do you suppose this consensus we have been talking about has something to do with that nobody questioned—

A: I think that was an important factor. They knew that we were getting into nuclear power, and they didn't question the priority. It was interesting. I learned something important. There were all these Army regulations, and I learned that Army regulations are written by people. I found out who had written the regulation and asked, "How do you do it differently?"

One of them said, "We can put out a change to the regulation." And they did.

Q: It is still amazing.

A: It is amazing when I think back on it. The amount we got done in a relatively short time. I had an Air Force captain and a Navy lieutenant working for me on my staff. Then I picked [Major General William R.] Bill Wray, who later became the Deputy Chief of Engineers, to be the head of the crew. He was in the advanced course at Fort Belvoir, and at the time he was the top man in that advanced course. In terms of average, he was doing the best of anybody. We just yanked him out of it. His wife was about to have a baby, and I sent him off to school at Penn State for three months to get smart about nuclear power.

That was a separate officer course. We sent two or three officers up to Penn State. They were going to be the officers in charge on the crew. The warrant officers and the enlisted men were sent to the University of Virginia.

Q: I have seen the organization chart for a crew in the mid-1960s and it was a little bit smaller than 18. I guess it was getting down to about ten people. But wasn't that a pretty big job for a captain to be in charge of one of these plants?

A: It might have been, but I think in that Army we thought majors and captains could do a lot. I guess it was a big job.

Q: How did you choose these people? I remember how General Groves chose you.

A: Well, two things—academic ability and their military records. From their military records, we could tell whether they could get something done. And academic ability. We wanted people that were smart enough that they could pick this stuff up quickly.

Q: The brochure I was reading yesterday, which was produced by the program in the mid-1960s, said something about creating teams of superbly competent individuals, and it still kind of struck me. I've been in the Army, and I know its manpower generally. Were you able to do that?

A: Oh, yes. We were able, because of this attitude toward nuclear power, we had no trouble getting the best officers to want to go into this. Lampert had a star-studded crew. Not all of them went on to stars, but he had crackerjacks. They were very bright, but they were also energetic and had initiative and would do things. Everybody thought that nuclear energy was the wave of the future in those days.

Q: Was [Lieutenant General Samuel D.] Sam Sturgis Chief of Engineers at that time?

A: Yes, he was.

Q: Do you have any idea what he thought about this?

A: No, I don't.

Q: Did he ever come down? Did he show any interest that you could see at your level?

A: I can't remember. Lampert, I know, was thought of very highly by them. When he finished that job he went to the National War College and on to bigger and better things.

My impression was that when he went to them for support, he had his act together. I know he was very tough on numbers of people. He would not ask for more people unless he was absolutely convinced he had a really tough job. I have forgotten what they told me at first, but I remember that I worked up a projection. In order to build this training program, I worked up a projection of all the nuclear power plants that I thought the Army, the Navy, and the Air Force were going to have of this type over ten years. Lampert was amazed when he saw that, because it ended up justifying putting three or four times as many officers into this type of education as were then being sent to graduate school in this area.

When he went over it, and saw, he said, "Yes, that's reasonable." We didn't have all these plants. The program did not grow that way. But I did this for the purpose of saying that, if we are going to have enough officers who know this business to handle the building of these plants and their operation—and that was our concept—this was where we are going to need people.

I projected not only the positions down at the plant level, but staff positions that we would have to fill in the Office of the Chief of Engineers and elsewhere around the world that we would need to have somebody that had education in nuclear energy.

The net result was many more officers than they had been talking about sending to graduate school. Once he agreed to it, we didn't have that much trouble from the Assistant Chief of Engineers for Personnel in supporting this.

Sturgis himself, I would imagine, was interested, but I don't remember any contact with him. I remember when we had the dedication ceremony for the reactor at Belvoir, Secretary [Wilber M.] Brucker of the Army and Mr. [Lewis] Straus from the Atomic Energy Commission came down and officiated jointly.

Q: That's a pretty momentous occasion.

A: That was, and I had to arrange it.

I'll tell you an amusing story. We wanted this ceremony to demonstrate the military and peaceful uses of nuclear energy. For the military use, we got a radar, one that would twirl around. For the peaceful uses we got a printing press from one of the topo units. We put them up, one on either side of the platform, so that when the switch was thrown, these things would start running.

I told Lampert that we had it all set up, and in case the plant wasn't running, we would just use the power from Fort Belvoir to run these things. He thought that was terrible. He said, "This is supposed to be a demonstration of a nuclear plant." I said, "Well, all right, but I want to cover the contingency that we may have a momentary outage or something. We wouldn't want to have all these important people there and have them throw the switch and there be no juice." Actually, the plant was running and there wasn't any problem.

Q: I guess preparations for that were pretty frantic—24-hour coil windings and stuff like that?

A: They had troubles. They had a short in the winding of one of the poles of the generator. They had to pull the thing and take it to Baltimore.

I think General Electric supplied the generator. But it might have been Westinghouse. It was one of those two big companies. They had to pull the thing, take it up there, and rewind the coil. The work involved a process of drying. When a generator is made, they use an epoxy to cement the whole thing together, because when it is turning at high

speed, there is a high centrifugal force. Everything has to be anchored in so that you don't have a problem.

One of the factors in scheduling all this was not only to strip out the old wire and do the rewinding, but to provide time for curing the epoxy glue that had to be put on to hold the winding in place. Yes, that was one of their problems.

Q: What became of the program?

A: The guy you ought to talk to sometime about that would be [Colonel Robert B.] Bob Burlin, who headed it for quite a time. And my West Point roommate, Ken Cooper, who was the last director. Basically, there wasn't an economic justification for these plants. They went on to the barge-mounted plant, the *Sturgis*.

Q: That's right.

A: They did use that down in Panama when Panama had a water shortage. They didn't want to draw down Gatun Lake because of the effect on the draft of ships using the canal. To supplement the power supply while they were building some big steam plants, they took the *Sturgis* down there and generated power in Panama.

But the plants were a lot more expensive than conventional plants of the same size. They were trouble because you had all the business about it being nuclear, and so you had to make a lot of extra arrangements.

Q: So opposition was beginning to emerge?

A: Opposition is too strong a word in this. But if it was nuclear and it was going to Panama, you had to coordinate with the Panamanian government that it was a nuclear plant. It had a special identity, and that took extra work.

I think the main thing was economic. They didn't have a plant that was economically competitive for these remote locations. And the Army spent its money on other things.

Q: Were you disappointed when the program petered out?

A: I had come to recognize that they weren't going to make it economically. I had recognized that some time before. Yes, except that I worked on a lot of different things that didn't go as far as they might. I am much more disappointed in the overall fate of nuclear power in the United States than I am in the failure of this program to make a major contribution. That would be my reaction.

In terms of my own experience, that was the first job I had where I felt that I really accomplished something on my own. I had done some things before that, but there was a case where Jim Lampert basically turned it over to me, and I was able to use my mind to figure out what had to be done. Then I was able to go out and do it. I had never quite had that opportunity before, and I got a lot of confidence from the success we had in the training for the power program.

Q: Was that his approach to all officers, or—

A: I think, yes. Of course, he was very careful in picking the people, and he was able to get a lot of extremely able people into the program. His deputies, Bill Gribble and then Elmer Yates, were extremely capable. Joe Bacci was one of the best in his area, construction. [Major William B.] Bill Taylor, who was the officer out of that program that had polio—

Q: Before Gribble?

A: Taylor joined the program before Gribble. Taylor was more junior, though. He was a staff officer who was helping Lampert from the very beginning on the justifications of the program. He was a captain at the time, and he was struck with polio, was very ill and out for a long time, and quite crippled by it.

He came back as a civilian, after he had had polio, and, of course, he had a distinguished career as a civilian in government. He was the technical director at the laboratories at Fort Belvoir for a time.

He was also the top R&D man in OCE for a time. Now, he's retired and living down south of Mount Vernon. He was another example of a very able person. I could go on because there was a whole string of them.

Lampert's idea was to let these people do their thing, and that contributed to the success of the program.

Q: Were you sorry to leave there?

A: Not as sorry as some other assignments because I had finished something. I had expected to be there about two years, and I went from there to Fort Leavenworth [Kansas], to the Command and General Staff College, which was something I very much wanted to do.

By the time I left, the plant was operating. It had a crew. I had gotten this graduate schooling program rolling pretty well. The other thing I had done was to develop a

recommended career pattern for operators. Shortly before I left we had a big meeting at which we presented to all the Army personnel and training people that would be concerned our recommendations for the career progression for enlisted people who would start out in the specialties—the electrical specialty, the mechanical specialty, the process chemistry specialty, and radiological safety.

There were these four specialties. We had worked out a progression—where they would start out and how they would move up the enlisted chain. There would be a warrant officer position at the top of each of these four ladders that they could move into. If you were going to have a large number of plants, you had to have a career structure for the people that were going to operate them.

I enjoyed the assignment, but I think in some other areas I was more disappointed to leave because I saw a lot of things still to be done. In this, there was still a lot to be done, but in the job that I had undertaken, a major segment was pretty well completed. So I was ready to move on to something else.

Command and General Staff College, 1957–1958

Q: You felt pretty good about going to Leavenworth when you did?

A: Yes. Yes, I did.

Q: Many officers go through that Command and General Staff College out there.

A: About half of any year group gets to go. If you are selected to go, that means you are going to go on and move ahead in the Army. If you don't make that, then it means you are going to have to turn to something else.

Q: So it's very important?

A: It's very important in your career. And, of course, the focus at Leavenworth is on the combat arms and their combined arms tactics. Some of the school was very interesting. Some of it was a little far-fetched. This was the era of the pentomic division, which was a creation of [General] Maxwell [D.] Taylor. This eliminated battalions. You had companies, and they were grouped in battle groups.

It has never been clear to me why we did this, except that I think Taylor wanted to break out of the mold of the tactics that preceded nuclear weapons and go to different

tactics. This odd organization was one way of making everybody do everything over again.

[Lieutenant] General [Lionel C.] McGarr was the commandant at Leavenworth, and he did not have the admiration and respect of most people there. He didn't come through well. He seemed to be arbitrary, and the whole curriculum was being revised as the result of this pentomic division. That created a lot of tension on the faculty.

One of the things that created the most consternation was his rule that any student could complain or criticize any member of the faculty. We had this sort of a challenge system. There were all kinds of challenges going on all the time, and the faculty was uptight because they would have to answer to McGarr if they were challenged. It created a lot of tension.

Q: It was not just doctrinal instability; it was also institutional instability.

A: Well, it was. It was his method of operation. The school survived this.

Q: And the Army did, too.

A: Yes. And we went to another organization, and so forth. I learned a lot there, but perhaps it wasn't one of Leavenworth's most shining periods in terms of its academic excellence.

Commander, 44th Engineer Construction Battalion, 1958–1959

Q: Did you know when you went there, or did you expect when you went there, that you would be going to a unit again?

A: I expected that after Leavenworth I would go overseas on an unaccompanied tour. I had been to SHAPE with my family. Because of the Korean War most people in the Army had been overseas, separated from their family. So I expected to do that.

I hoped to get a command. But I wasn't too savvy in the way these things worked. I wrote some letters and talked to the people in the Office of the Chief of Engineers about this, and they assured me that that's what I was supposed to do.

But it was somewhat of a lucky happenstance that I got a command as easily as I did. It came about because my West Point classmate, [Lieutenant Colonel Robert M.] Bob Rodden, had been working more assiduously than I and had been in communication with the people in Korea. He had pretty well lined himself up to take command of the

44th Engineer Construction Battalion, relieving a classmate of ours, [Colonel Charles L.] Charlie Steel, who had the battalion.

As the spring wore on, Bob had an opportunity to go into the food irradiation program, which was a nuclear program, the concept of which was to sterilize food with high intensity gamma rays. If food is sterilized in this manner, it will keep for months if not years, simply by being hermetically sealed. It doesn't have to be refrigerated. The concept was that with this technique the Army could greatly simplify and improve its whole ration system.

Bob was one who had been involved with the nuclear business before, and he had the opportunity to do this. It was a new program. I think he decided at that point in his career, that instead of following the traditional engineer career pattern, he would get into this, because it had a lot of possibilities. He transferred to the Quartermaster Corps in order to go into this food irradiation program.

When he did that, it left the command of the 44th Engineers uncovered, and I was there on their list. I don't know whether they had had any thoughts of what to do with me up until that point, but it was very convenient then to say that I would take the 44th. That was great.

Q: Did you have any concerns, thinking back on your last troop assignment with the 1282d?

A: Yes. I hadn't been with troops in a long time. I certainly had more confidence in my ability to get things done, but I really didn't know what I was getting into. When I arrived in Korea, I found a lot of very good things in this battalion, which were the result of what Charlie Steel had done.

They had a high esprit, and they had an ethic of getting work done. They got out early and they did a lot of work, and they had done tremendous projects in the year before I got there. On the downside, their administration was deplorable and their equipment situation was a catastrophe.

Q: In terms of maintenance or supply?

A: Maintenance and supply.

Q: Both.

A: And they weren't very strong in planning. One reason they weren't was that their compound was in Bup Yong. It was called ASCOM [Army Service Command] City

then. It was a big area between Inchon and Seoul, which the Army had built into a large depot area. The 44th Compound was there.

Q: Was your whole battalion there?

A: No, some companies were out. Company C was up in the direction of Chunchon, where the whole battalion had been and had built the cantonment for the 4th Missile Command. They had worked all the preceding winter on this.

I arrived in September. Soon after that Company B went down at Osan, south of Seoul. One of the major airfields is there.

Habitually the 44th had people spread out. Shortly after I arrived there, because of the personnel shortages, they inactivated C Company. Most of the time that I was the commander, the battalion had only Headquarters and Service Company and A and B Companies.

I didn't have that hard a time getting a grip on things in the 44th. However, I learned a very important lesson there, from a captain named Pat Conboy who had been a policeman in the Los Angeles or the Long Beach police force before he had come back on active duty in the Army for the Korean War. He had been in World War II, had been out, and then had come back.

As you do when you are commander, I would go around and see everybody. After I had been doing this a couple of weeks, Conboy said that I was being too tough on the men, that I was not giving them enough credit for what they were doing well, and that morale was sagging because I didn't seem to appreciate all the good work that the battalion had done. Most of my remarks were critical.

He told me this in a very good way, and I saw immediately that he was right. Maybe I should have known this before, but I didn't appreciate it enough. I made a concerted effort when I went on a job to be upbeat with the people. Of course, you shouldn't correct people in public either, or if you do offer advice in public, you do it in a way that doesn't find personal fault.

So I learned a lot there in those first couple of months about how to deal with my subordinate commanders and the soldiers in the battalion, and that paid off in terms of doing things right.

But I also did a lot about getting things organized, particularly in the administrative area and in the area of maintenance. We achieved a tremendous improvement.

I was blessed by having assigned to the unit a couple of warrant officers that were outstanding in engineer maintenance. They came after I had arrived, but they could do all kinds of things.

We were very lucky to be right next to the engineer depot. Only instead of doing it the way it had been done, which was to drop over there and make deals with the depot commander, we submitted some requisitions, which had been an unheard of thing up until that point. And I got on to the staff. They were very proud of the fact that they could slip over there at the last minute and get things when they needed them. Conboy was bragging to me about this one day, and I said, "Look, that's all very well. But you wouldn't have this problem if you would make better plans." So we overhauled that.

But the battalion did do a lot of work.

Q: What kind of work?

A: Two main things. Asphalt paving and building shelters for the Honest John missiles.

The 4th Missile Command, as I mentioned, had just deployed there. Their headquarters was at Chunchon, but there were storage sites for Honest John missiles all over the place. Of course, these were nuclear capable. I had nothing to do with the nuclear aspects of them.

The battalion built storage buildings for the storage of all the parts, and the storage buildings had to be heated because the solid fuel rocket motors of the Honest John missile could not stand to be frozen. Of course, that got improved later on, but at that stage, the propellant could not stand extreme cold.

The whole matter of building these heated shelters was a real trial because the buildings themselves were highly inflammable. The heating units were modified Nelson heaters—you know, the kind of thing that was just an open gas flame with a blower on it. We had some real trials with this thing.

It was all we were capable of at the time. The missiles were coming, and they had to get them in out of the cold.

But the asphalt paving was more a source of pride. We had several asphalt plants, not very large ones, and A Company was sent up north into the area of the 7th Division to pave roads. We moved the company up there in the winter to prepare for paving when the weather warmed up.

The camp was south of the DMZ [demilitarized zone], but north of Uijongbu, up north of Seoul. They had a rough time at first, but they got organized finally.

Among other things, the 7th Division gave them a camp area which looked great when everything was frozen. But when it thawed out, it turned out to be a quagmire. So they had to move the whole company in the midst of working.

Getting aggregate for the asphalt was a huge problem. We ended up finding a stream filled with cobbles that ranged all the way up to a foot in diameter. Instead of having a quarry, we just dozed this material out of the stream.

There was one problem with it. It had too much sand in it to get the right gradation when it was put through the rock crusher. We built something called a grizzly—a sloped grid of steel rails. We dropped the material from the streambed onto the grizzly. The sand would drop through between the rails and only the rock would go into the jaws of the crusher.

By this method we got aggregate that was well graded and had enough fines. This was the problem. To get good strong asphalt concrete, you have to have five to six percent binder; otherwise it ravels out and comes up. If you don't have enough fines to absorb the asphalt, five to six percent is too rich in asphalt, the pavement oozes. The secret is in the fine fraction. We managed to solve that after several weeks. Once they got going they did an outstanding job.

There is one thing that we did that was very important. In the 2d Engineer Group at that time, there were three battalions: the 44th, the 76th, and the 802d. As the result of what Charlie Steel had done, the 44th had the reputation of being the best of these battalions, at least as far as getting work done. I think that was maintained.

Some years later, my West Point roommate, Ken Cooper, commanded the 76th. He claims that at that time the 44th had sunk to the bottom, which indeed it may have. I don't know anything about that except what Ken has told me. I only know what it was like when I was there.

For this asphalt paving mission, we had a company of my battalion that was up in the 7th Division area and a company out of the 76th Battalion up in the 2d Division area. In each area, the combat battalion of the division was supposed to lay the base course, and the construction battalion was supposed to lay the hot mix paving.

Neither combat battalion did very well. They had all kinds of excuses—equipment and so forth. So there wasn't very much base course being laid. We would go to the group meeting, and there hadn't been much hot mix laid. The minute I realized that this wasn't

a transitory situation, I told [Colonel] Jack [G.] McNall, the commander of A Company, to start laying base course.

He didn't complain about this. He said, "It's going to be tough. We aren't going to be able to produce the amount of hot mix that we projected if we are using our rock for base course."

I said, "That's all right. First, we will get started. We will try to operate more shifts on the rock crusher in order to produce the material, but we have got to get on with it." So we did lay quite a bit. Then the 13th Engineers, which was the battalion of the 7th Division, started to do better, too. With our help on the production of the crushed rock, they started to be more effective.

In the meantime, over on the other side, the 2d Engineers, which was the 2d Division battalion, and the 76th Engineers were busy complaining about what the other outfit wasn't doing. They got nothing done during most of the summer. Toward the end of the summer, they did get their act going. We had done all the paving that we said we would do and had shut down our plant, and they were still up there trying to meet their targets for the year, when the weather was getting cold.

The whole principle involved here was, "Don't let there be a gap." If you are sharing a job, reach out and do more than your share if necessary to get it going. Once we got that attitude inculcated into people, we produced a lot of work.

It is a much more healthy attitude than to stand around and say, "These people were supposed to do something and they didn't do it; therefore, we haven't done our job."

We got together and I insisted that we weren't going to take that approach. If we were involved in something, it was going to get done. If it became impossible, all right, but we weren't going to quibble that the other guy didn't show up; therefore, no work was done that day. I have tried to practice that since, and that is the way you get results.

Q: Is it kind of risky to share a job like that? I mean—

A: It is common. The whole business of units working together, I think it goes on in the civilian trades as well. In the Army, you have all these units, and they all have to work together. If they have the attitude that they are going to cover the interface and reach a little beyond—you should define the interface, of course. There is no issue there. We should be clear on what each party is going to do. But then, if there is a problem, you should be reaching out to do a little more than your share so that you are sure there is no problem with something not being covered.

Q: You mentioned a personnel shortage, and the deactivation of one company.

A: That is an interesting point. The battalion had the following approximate numbers of people: 300 U.S., 350 KATUSAs [Korean augmentation to the U.S. Army], 500 to 600 KSCs [Korean Service Corps], which was a civilian work force.

Q: I've never heard of the KSC.

A: Actually, we had two battalions at one time of these KSCs, the Korean Service Corps. Then it was cut back to one. And we had, when I left, about 200 Korean civilians. One of the secrets of the 44th's success was that they had always had these Korean civilians. They weren't part of the U.S. civil service, but they were part of a parallel effort, a local-national effort. The 44th had 20 or 30 carpenters of this type, and they also had a support center composed of blacksmiths and machinists and that type of people.

They had scrounged up all of these machine tools. This support group could make almost anything. I mentioned that Conboy was so proud of what they could do. One of the things he described to me was the hinges that they had made for the doors for the shelters for the Honest John rockets.

I said that was great, but had we requisitioned any hinges for next year? They hadn't. And that was when we had the falling out. I said, "Fine, we can make these hinges."

Q: But why should we?

A: Why should we. We've got other things for these guys to do. When I first took command, the group commander was Larry Lawrence, who was somewhat of a timid, bureaucratic colonel. He said that we should look over our Korean civilian complement because they were planning to reduce personnel. In response to this, I came in with a memo proposing to triple the number of Korean civilians. I said, "We've got all these people over here. The object is to get work done. These people are highly skilled." With a short tour here in Korea—the tour was 16 months at the time—and a lot of relatively inexperienced draftees coming to the battalion, the only way we maintained our proficiency was to have these Korean civilians. The KATUSAs were good for guard duty and truck driving. We got very few skills from them. Occasionally we got somebody, but they were draftees—the KATUSAs. They were Korean draftees.

We had only 300 Americans. The KSCs were labor. We didn't get skills in that. That was shoveling and carrying and so forth. These Korean civilians represented the most skilled people we had. We had the carpenters. We didn't need more of those. We had the machinists. But where we needed more skilled people was in equipment operating, crane operators, in particular, because cranes are very delicate machines, in spite of

their size. If they are not operated skillfully, the clutches, the gears, and the shafts are worn out quickly, stripped, or broken. And dozer operators. And mechanics for maintenance.

We did not have any Korean civilians with these skills. I was convinced that if we started a program, we could hire these people. Then equipment operation and maintenance would become as strong as these construction trades were already. In that way the battalion would be extremely productive no matter what the vicissitudes were of the Army replacement system. That happened during my tour.

Tom Lipscomb was the Eighth Army engineer. He was a guy that believed in getting things done, and he supported us on these things.

Q: So you had three different kinds of Korean labor, and you had three times as many Koreans as you had soldiers.

A: Yes. It was a big operation. There were over 1,200—at one point there were as many as 1,400 people. But for most of the year, there were over 1,200 people in this battalion. It was a big operation.

We did get a lot of extracurricular stuff. We traded—I will give you an example.

We were putting up many prefabricated buildings, and the kits for all these buildings included plywood floors. However, most of the construction called for concrete floors. So we had thousands of sheets of plywood. We would trade 80 sheets of plywood for a new truck engine from the ordnance battalion up in Seoul that was rebuilding truck engines. We would replace our own truck engines.

That was a third echelon maintenance job that was supposed to be evacuated to some ordnance outfit to do. What we did to keep everybody happy was to put one of our trucks in this ordnance company so that they could have it. They would keep it for—I don't know how long.

In the meantime, while they had our truck, supposedly replacing the engine, we would be changing ten engines in our own shops with engines that we had obtained from the ordnance rebuild battalion in exchange for plywood.

The whole thing was done that way. We had a lot of things. We had a big tanker, which we had borrowed from the Air Force on Kimpo Airfield. Every year when we had the IG [Inspector General] inspection, the tanker had to be taken back over and parked at Kimpo because it was an unauthorized piece of equipment. The day after the inspection, they would go back and get it. We were absolutely dependent on this tanker for all our

refueling. We were given one small truck on our TO&E and we could not possibly have kept this operation going without this borrowed piece of Air Force equipment.

I obviously am enthusiastic about what the 44th did. They really did work.

I have to tell one other story. When we were supporting the 13th Engineers on this paving, I went up to see them, and they were very courteous. We had a nice visit and stayed overnight. But in the meeting we were talking about work call, and I asked, “When is work call?” They started going through this explanation. I said, “Well, work call in the 44th Engineer Battalion is seven o’clock and I hope you guys are going to be out there because we are.” Well, that kind of flustered them.

Q: Did you get involved in any civic action projects?

A: Yes. We supported some orphanages. We did work there. We did earthwork. They could get a lot of things done, but if there had to be roads built, that was a problem.

We also supported a Korean police academy and helped them with equipment to build a parade ground—to fill a very uneven area so that they could have a level area.

The chaplain of the battalion had a close association with some of the Korean Christian churches, and we exchanged services with them while I was there.

I didn’t make any lasting friendships out of that. I remember at the time that we had great pleasure from associating with these people, but I guess I was remiss. I didn’t keep up my contacts with them. We would do our civic action work on Sunday, although there were periods when we were working a seven-day week. When we were trying to get these shelters for the missiles done, we worked a seven-day week. And then we backed off to six days after that. But we always worked at least a six-day week.

Q: Is that how these civic action projects got done normally on Sundays—with volunteers?

A: I think, by and large, that was the way they were done. Occasionally we would put a piece of equipment out at a place and leave it there with an operator. If there was some project where they needed it, we would put it out there for a week or two to do work.

Sea-Level Central American Canal, 1959–1967

Q: When you left there, you went back to nuclear physics, didn’t you?

A: Yes. That's an amusing thing. I was scheduled to be the deputy district engineer in Mobile.

Q: In 1959.

A: When I came home. Colonel [Robert W.] Love was the district engineer, and I was going to be his deputy. I was really looking forward to that.

Q: That would have been your first civil works assignment?

A: That would have been my first civil works assignment.

And my little son Willy would tell everybody that we were going to "Oatmeal, Alababa," which was the best he could do with Mobile, Alabama.

But about the time the orders were issued, there came on the scene this project to build a sea-level canal through the isthmus using nuclear explosions. This changed my life.

I was drawn into this—I think, to a large extent—by Dodd Starbird, who, at the time, was the director of Military Application at the Atomic Energy Commission, a job I later had. Starbird had been at SHAPE when I was there, and had been the deputy secretary. [General Robert J.] Bob Wood was the secretary; Starbird was his deputy.

The idea for this project came from several people, but the guy that pushed it ahead was [Major General William E.] Joe Potter, who was the governor of the Canal Zone. He was famous for being involved with some of the riots down there.

Potter felt that the solution to the problems with Panama was to get a sea-level canal so that you wouldn't be involved in all the complexities of a lock canal. Also, the traffic was growing. If you looked at the traffic projections, it looked as if the lock canal would become a bottleneck in the future.

Q: Was Potter the main proponent of this sea-level canal?

A: At that point he was the one that was really pushing for it. The Panama Canal made a large study in 1947 and had come up with all these different routes, all the way from the Isthmus of Tehuantepec in Mexico down to a whole series of routes that employed the Atrato Basin in Colombia.

They had estimated all the costs of all these alternatives, and the costs were out of sight. The following thing happened: in the test moratorium that started in 1958 and lasted until 1961, the testing activities of the weapons laboratories were suspended. So you

had all these people looking at things. A lot of talented guys that had been working on testing didn't have a lot to occupy them, except planning for tests when the moratorium was over.

They came up with this idea of peaceful uses of nuclear explosions. They came up with a lot of different uses. Excavation was the most straightforward.

They started looking around for excavation projects where this would be suitable. One of the projects that looked good, technically, was a sea-level canal somewhere in Panama, or one of the neighboring countries.

They sought data from the Canal Company on the topography, geology, and a whole lot of other things. When they started asking for all this information—and this was done by the Lawrence Radiation Laboratory in Livermore [California] and the Sandia Corporation in Albuquerque—Potter's people wanted to know what they wanted all this information for.

So they told him. When Potter found out about this idea, he got to thinking. These guys believed that you could do this for a third of the cost of conventional excavation. When you started looking at the costs that they were then estimating, it looked as if the canal would be an economic proposition.

They decided to have a joint study—a study that would involve the Panama Canal Company, the Atomic Energy Commission, and the Army Corps of Engineers.

You have to remember that the Canal Company and the Corps were separate organizations, that there were engineer officers assigned to the Canal Company, but their chain of command was to the Secretary of the Army, and the Corps wasn't directly involved in the command line.

One of the concepts they had at this early stage was to take a young engineer officer and put him out at Livermore to learn about this. They latched onto me.

I wrote protesting that I didn't want to get into this anymore because I wanted to go on and do the district work, and I really didn't want to go back to the nuclear work. However, I was overruled. My West Point classmate, [Colonel Robert R.] Bobby Wessels, was in personnel in the Office of the Chief of Engineers. He wrote me the most magnificent sales letter I have ever seen. He finished up with the following sentence, which I thought was a masterpiece. He wrote, "I want to be able to tell my grandchildren that of Goethals, Gorgas, and Graves, I knew the last the best."

That was quite an inspiration: the idea that we were going to build another canal and that, if I got started at this stage of my career, by the time they came to build it, I might be in charge of it. I worked on that for quite a few years, but it wasn't to be.

Q: I want to go through step-by-step with your assignments. But for about the next ten years you were involved in one way or another with the Panamanian isthmus, weren't you?

A: That's right. With time out for being the deputy district engineer in Los Angeles one summer and going to the Army War College, from the fall of 1959 until February of 1967, I worked basically on the Panama Canal and nuclear excavation. I learned a lot. In those jobs, I again was given a chance to do things. I learned a lot from that. I had tremendous opportunities.

Q: I notice the trend of your jobs, particularly your last involvement, is you're moving out of the technical part and into the diplomacy of relations with Panama. Is that right?

A: That's true—although certainly at the beginning, it was very much technical. My first tour at Livermore, from the fall of '59 until April of '61, was technical. I worked on a study of what would be involved to do this canal project.

Q: So you were focusing specifically on that project?

A: The technical aspects. They had made some crude estimates. But they had never really planned the project. For example, they had only the vaguest notion of how long it would take.

I worked with a number of the people at Livermore, particularly a civilian scientist named Milo Nordyke. We worked out in much more detail the size of the explosions that would be needed and the problem of how these explosives would be emplaced, whether in holes or in tunnels.

We worked on the cost of these emplacements. Then I tried to do some work on the costs of all the appurtenances, because even though the scientists started out talking about the fact that we were just going to blast the ditch through here, all kinds of streams were going to be intercepted by this. The drainage for those streams had to be considered. We tried to make rough estimates of what the whole engineering job would involve.

Then I left to go to Los Angeles, and that's when the Russians broke out of the test moratorium. Harold Brown and Gerry Johnson, who had been at Livermore, moved to Washington. Brown became the director of Defense Research and Engineering.

Q: This is the Harold Brown you worked for later?

A: Yes. He had been the deputy director at Livermore. And Gerry Johnson who had been the associate director for testing and Plowshare at Livermore became the assistant to the Secretary of Defense for Atomic Energy, the chairman of the Military Liaison Committee. They were interested in these peaceful uses—Johnson, in particular.

The other thing that happened was that President [Roberto] Chiari of Panama wrote a letter to President [John F.] Kennedy asking about renegotiating the 1904 treaty. The White House referred that to the State Department, where it was placed in the hands of a lady named Kay Bracken, one of the top people in the Bureau of American Republics, with responsibility for Central America. She had the job of coming up with an answer to this letter.

The view of the State Department, then, was that any effort to renegotiate this treaty would be nothing but trouble. Of course, later it proved quite difficult for other Presidents, and President [Jimmy] Carter had quite a time getting it ratified. The State Department really didn't want to get this started.

They were groping around for some way to deal with this political problem. They came up with the following: if they proposed the sea-level canal as something that had to be looked at, this would postpone everything.

Q: Construction in politics?

A: They wrote to Chiari to the effect that, we know there are difficulties, but the United States really cannot consider a new arrangement with Panama until we decide whether or not we should build a sea-level canal. Incidentally, I'm rusty on this, but there was some provision relevant to a sea-level canal resulting from the 1935 revision of the treaty agreed to by President [Franklin D.] Roosevelt.

There was a provision that gave the United States some rights with respect to building a sea-level canal. So we could write to Chiari that, until we resolved whether we were going to build a sea-level canal or not, we couldn't really get down to cases on any new arrangements.

There was another angle to this whole thing. The State Department thought that the Army Corps of Engineers had a lot of friends up in Congress and that they would get the Army Corps of Engineers engaged in this sea-level canal project. Then, if, in fact, the new arrangement with Panama was an integral part of building a sea-level canal, they would get the Corps of Engineers to help them put this whole thing across in Congress.

Q: That's curious.

A: Well, it is. It's curious. But it was, conceptually, quite intriguing. Put all this together. We had a Canal Zone in Panama which was a great problem because of being lodged across the middle of Panama. We had this big American community there. Basically, technology was going to solve this. We were going to build a sea-level canal which didn't require a big American community, and it was going to have unlimited capacity so that we would never have to worry any more about whether there was enough water or how long it took to lock a ship through. All that would go away.

Then, as far as selling this to the United States, you bring in the Corps of Engineers with its reputation with Congress. This would generate the kind of support from Congress that would be necessary to do all this.

In order to get this going, we had a study group. They brought me back from Los Angeles on temporary duty in the winter of '61-'62. I spent the whole winter on this study group and wrote most of this report, including the paper to President Kennedy that he approved. I can't take sole credit, but I was on this group as a technical advisor, actually. But I ended up writing most of the paper.

That's what Johnson got me back doing. Stephen Ailes was Secretary of the Army. Johnson talked to Ailes about having me on this group and Ailes agreed. That's the way I got on the group.

Q: Was Johnson then assistant for atomic energy?

A: Yes. In the Office of the Secretary of Defense. He had no direct connection with the group, though. In other words, in those days, the Defense's involvement with the Panama Canal was all in the Department of the Army, all in the Office of the Secretary of the Army.

But Johnson heard about this. He got Brown to agree to support it, and he went down and saw Ailes and said he would like to involve me in the study since the nuclear option was going to be the important aspect. Ailes could see immediately that that was good because the motivation of most of these people was, in my opinion, they weren't about to turn the canal over to Panama if they could avoid it.

As we had more difficulties with Panama, we came to the view that perhaps the better part of valor was to give the canal to Panama, which is what we're now doing. But things have changed a lot since then.

You're talking now the late '50s, early '60s. We still viewed the Panama Canal as much more important than we now do. And it was very important in the Vietnam War. Tonnage went way up.

If you look at the tonnage now, the canal is not anywhere near as high on the horizon for the United States. You don't have the interest that you had then. We're much more comfortable with the proposition that they're going to take it than before. In those days, it was unthinkable that we would give it to them.

Q: It's like nuclear energy. There was a pretty firm consensus.

A: Yes. I'm sure there were people that thought we ought to give them the canal. That's another whole story.

You mentioned about my getting more into the diplomatic end of things. Ambassador [John] Muccio, who had been our ambassador to Korea and was a retired ambassador, was put in charge of this study group. There were people on the study group from the Atomic Energy Commission and from the Department of the Army and so forth.

They met in the State Department. Kay Bracken was trying to get this study group to come up with the right set of recommendations to help her handle this reply to Chiari, which we did. We wrote this paper to President Kennedy which recommended that he put it on the basis that we couldn't do anything until we resolved the sea-level canal issue. Then it also directed that a program be started to investigate the use of nuclear explosives for excavation.

Q: So the use of nuclear explosives for excavation wasn't a secret matter?

A: It became public then. Basically, it had been secret up to a point. I think if you looked at the papers that were written, say in '57 and '58, most of those were classified.

About the time that I got to Livermore, which was the fall of '59, there started to be some open work. It got to the point where the part that remained classified was the devices themselves—the design of devices that would be clean enough to be used—because that got into some of the most advanced weapons technology.

But in terms of the effects of the explosions—the size of the hole, the amount of radioactive debris that would come out—well, that was sensitive because that related to the type of device. But the percentage of the debris which would escape and the air blast from these and the ground shock, all that information, a great deal was unclassified and made public.

Q: Would it be accurate to say that some of the interest in the use of nuclear demolitions was, in part, an effort to continue military testing under some sort of a guise?

A: There is no question that the civilian scientists at Livermore conceived of the Plowshare program as a means to assure testing. That unfolded even more as we got along further.

Kennedy did negotiate the limited test ban treaty, which prevented testing in the atmosphere and also prevented testing underground if radioactivity crossed the border of the country that did the testing.

That was the first major setback for the whole concept of excavation. It didn't kill it because the excavation people argued that they could make the devices so clean that detectable amounts of radioactivity would not cross the border.

This was really stretching credibility. But because of the tie-in with the Panama Canal, the government took the position that this was attainable. I think if you stood back, and I certainly wasn't kidding myself in the midst of this, you had to take the view that the project in Panama could not have been done under the terms of the treaty.

What we argued was that if the technology progressed and these devices were made cleaner and cleaner—in other words, less and less fission and more and more thermonuclear, which does not have the residual radioactivity—then you could negotiate a protocol to the treaty which would allow certain types of peaceful projects.

In fact, I think if you look at the record, you will find that the Soviet Union's peaceful nuclear explosive program in the aggregate has been larger and perhaps more successful than the one the U.S. pursued.

Q: For some reasons that are obvious, I guess.

A: They have a lot of real estate out there, and they don't have the same public problems that we have.

But I'm thinking now about the Limited Test Ban Treaty. As I remember, it was ratified in 1963. That's when I was back at Livermore as the director of the Nuclear Cratering Group.

We had to do a lot of work to reorganize our effort so that it was consistent with that treaty. But they did conduct some cratering shots after the treaty was signed. They didn't have as much trouble with venting from those shots as they did from some "contained" shots that leaked.

They have had a lot of underground tests at the Nevada test site and, of course, still do. And these are done in deep holes. They had a couple of infamous cases where the stemming, that is, the plug that they put in the hole, failed. They got leakage, and the radioactive debris from that went all over the place. Then there was a huge argument about whether it had crossed the U.S. border in detectable amounts or not.

I'm only amplifying the point that the layman would have said, "If you have a treaty like that, you're never going to be able to do this." But the people doing the program kept it going. I think they were able to do that, to a substantial extent, because of the Panama situation.

Q: Did you really think for a minute there that you might be getting into civil works in 1961 when you went to L.A.?

A: Yes, I did, although it became evident that I probably wasn't. What happened was, I went there as the deputy district engineer. Then after I got there, I learned that they planned to assign a more senior guy in the fall, and he was going to be the deputy district engineer.

While [Major General William T.] Bill Bradley may have had the other plan, the main thing he wanted me to work on was the ICBM program. That was going to be very interesting. As the Air Force got going on the ICBM program, they first worked primarily with the Los Angeles District.

Q: Was there a Los Angeles field office, or was that already a thing of the past?

A: They had the Los Angeles field office. Then that became CEBMCO.

The Air Force was having the Los Angeles District build the pilot facilities at Vandenberg. For most of the facilities that were being built all over the United States by CEBMCO, there was a pilot facility built first at Vandenberg—to work out the bugs before they did mass production for the operational missile field. It also was to provide a facility to be used at Vandenberg for training. So the Los Angeles District was involved in building one of each type of launch facility at Vandenberg.

Q: Atlas and was Minuteman already—

A: No. Minuteman came at the end. We started with Atlas. That was the first. The Atlas missile at the beginning was launched from a pad on the surface. Then they did a certain amount of protective work. It wasn't until they got into Titan that they really went underground. Then, of course, Minuteman again was underground.

That was a huge workload. The civil works program in Los Angeles consisted primarily of the Los Angeles flood control plan which had started back in the '30s as a force account. They had been building a magnificent system of drainage for Los Angeles County—an open rectangular channel, lining all the channels.

There were a certain number of ponding areas, or reservoirs, which were used for recreation and golf courses. In the event of a major flood, these areas would serve as catchments so as not to overload the drainage system.

Q: Kind of a nonstructural aspect?

A: Yes. The project started in the mid-'30s and it continued. It was finished finally in the '70s. It was built on an incremental basis. That was the main civil works effort that was going on.

As the thing evolved, [Colonel William S.] Bill Crumlish, who was senior to me, came in. Although I'd been assigned to be the deputy district engineer, I was still a major, and he was a lieutenant colonel. When he arrived, he became deputy district engineer. But then almost immediately, I left. So I had a very short tour as the deputy district engineer in Los Angeles.

Q: And it wasn't going to be civil works anyway?

A: Once they decided to appoint Crumlish, I was going to go into the ballistic missile work.

The main thing I did during that summer was to troubleshoot the construction for the Nike-Hercules installation around Los Angeles. They were having incredible difficulty with the electric power system. The radars were not working well. The argument was over whether it was the standby power that was causing the problem or the radar.

There was a shootout between the radar contractor and the construction contractor over whose fault it was. We set up an elaborate test to try to determine this, but it was inconclusive.

Q: Then you went back to this study commission on Panama?

A: Then I went back to the study group, which lasted all winter. As I recall, the memorandum for President Kennedy's signature was called a NSAM, or national security action memorandum. I wrote in it that the nuclear excavation research and development program would be conducted by the Atomic Energy Commission and the U.S. Army Corps of Engineers.

When this came out over his signature, that locked in the fact that there would be a development program and that the Corps and the AEC would each have a piece of the action. Then the issue was to set up the organizational arrangement for this. I proposed, and it was approved, that we put a Corps of Engineers group at Livermore.

Then we had to work out the reporting chain. The reporting chain from that group was to the Director of Civil Works in the Office of the Chief of Engineers. At that time the director was Bob MacDonnell.

[Lieutenant General William F.] Cassidy had been Director of Civil Works at the beginning of this whole thing. Then he became the Deputy Chief of Engineers for Construction. Then he became the Chief of Engineers.

Bob MacDonnell was the director in 1962. There was no problem on that end. My biggest problem was with the laboratory at Livermore. You may wonder why that was.

The laboratory at Livermore was very academic in its bureaucratic politics and extremely jealous of its independence and prerogatives. When I had gone there as a young Army officer, there had been a fetish over the fact that I worked for the laboratory and that I could have no out-of-channels contact. They were very concerned that if outsiders came to work at the laboratory, that could result in extracurricular channels whereby the work of the laboratory would not always be reported through their leadership. They were afraid that some junior military officer would tell his military superiors that they were working on this bomb, and it would get all messed up.

I felt then and still do that this was juvenile. But in any event, there was a fetish over the relationships. So when I proposed to go out and set up this group, I knew that there was going to an argument over just who worked for whom and why.

Q: This was the Nuclear Cratering Group?

A: Yes, the Nuclear Cratering Group. I managed to work it out with them. I had friends there and they did have confidence in me. I had an independent group with only a small number of people.

They gave us office space. They didn't charge us rent. There was no quibble over money. We got our relations worked out, but it wasn't easy.

Just to finish up on that point, there was a genuine need to agree on the respective roles of the Atomic Energy Commission, the Corps of Engineers, and the laboratories in this development program—in other words, who would be responsible for what.

Within the Lawrence Radiation Laboratory at Livermore, there was a slight difference of view. I think the top leadership was primarily interested in device development—that is, the explosives themselves. They were willing to turn the whole effects business over to the Corps or whoever would take it—the whole business of the size of the crater and all that. Let the Corps do it.

However, within Livermore, there was a scientific group that had been working in the effects area. They didn't want to relinquish this work to the Corps.

I wasn't that particular. I said that the Corps of Engineers wanted to be in a position to design the projects. We wanted to develop the capability—if we had a particular water project that we wanted to do using this construction technique—to design the excavation.

We were perfectly willing to turn to the Atomic Energy Commission for the explosives, hire them to come on the job. We would probably build the emplacements, such as a tunnel or a hole. But they would come on the job and put the explosive in the hole and blow it off. That was perfectly all right.

Also, we knew that they would have to be responsible for safety. Well, I think that got to be accepted. But there was a lot of argument about this along the way.

Q: The Nuclear Cratering Group was engineer personnel?

A: The Nuclear Cratering Group was a combination of officers and civilians. The civilians were employees of the Corps of Engineers. The San Francisco District of the Corps provided the administrative mother of this thing. They handled the payroll and all the other administrative functions.

We had one guy who was the budget officer. Everything else, such as the personnel records, was in San Francisco. It was not that far away—only about 50 miles.

Q: Did you pick the people yourself?

A: I picked every single one of them. We got very good people. There was an interesting transition in the midst of this. There was one man I wanted to get and didn't. I got Bill Wray. He came as my deputy. I wanted to get another classmate of his—[Colonel] Ferd Anderson, who was another very capable guy.

There was an argument between me and Bob Mathe, who was the head of officer personnel in the Office of the Chief of Engineers. The amusing thing was that on July 1st, 1962, the personnel functions of the Chief of Engineers devolved to the new

personnel setup—the so called OPO, Office of Personnel Operations. On the 1st of July, Mathe no longer worked for the Chief of Engineers. He worked for the Chief of OPO, General Steve Hanmer, who, incidentally, was an engineer. But in any event, what happened was that Mathe simply stalled me out on Ferd Anderson. Once he'd gotten out from under the Chief, there was nothing I could do.

By and large, I got support. I got a lot of support from Bob Mathe on getting talented people. Most of the civilians were people that had been connected with the Atomic Energy Commission. The man I hired to do radiological safety and other safety aspects of it had been working in the Lawrence Radiation Laboratory. He came with us.

That caused a big furor—the notion that anybody that worked for the Lawrence Radiation Laboratory would step down and work for the Army Corps of Engineers. They got very mad. They said I had used unethical recruiting tactics—that I'd offered to pay him far more than he was worth, and so forth and so on. I'm a little harsh on these guys. They were great friends of mine. But when it came to this type of thing, they could be something else again.

Q: The first time we talked about tension between civilians and soldiers in the Manhattan Project. But this seems to have been much more severe. Is that true?

A: Well, no. I think it was much less severe. But the laboratory was very jealous of its independence. They brought to this the sort of attitude that you run into in universities. You're probably familiar with it. In the intellectual climate you have there, a lot of disagreements are handled in a way peculiar to academics. The Army has its own shortcomings of this type, its bureaucratic ways. There's an academic bureaucratic way of doing things, and that was typical of the laboratory.

Q: It's a different subculture, for sure.

A: It's a different subculture. There wasn't a basic animosity towards the military. They felt the same way, for example, about the management bureaucracy of the Atomic Energy Commission, which was the source of all their money.

But they fiercely guarded their independence. This was the University of California. This was not the government, and they didn't want anybody to forget that. I know because I worked with them for years. I learned to respect these things. But down in the trenches, there were occasions when it was a trial.

Q: Was your chief operational focus still Panama?

A: Yes. We launched a study of how to do the canal. Then Congress passed a law creating the Atlantic–Pacific Interoceanic Canal Study Commission. This had its own independent life. Robert O. Anderson was made the chairman of this five-man group. The President’s brother, Milton Eisenhower, was a member. [Brigadier General Kenneth E.] Ken Fields was a member. The other two members were Bob Story and [Colonel Raymond L.] Ray Hill. All five were distinguished Americans.

Their job was to look at the whole problem. The effort there in Livermore became an element of this larger study. It was funded independently through the civil works program. But the focus shifted to helping develop the report of this commission to the President and the Congress.

We had set up a fairly elaborate study structure in order to address all the issues, all the effects issues. There were fundamental questions about how big these craters were going to be, depending upon the material in which they were made.

There was an even more serious question about the stability of these craters because there had been a history in Panama of tremendous landslides. In a cohesive soil, the stable slope depends on the height. In a noncohesive soil, like sand, it doesn’t matter. It’s an infinite proposition. But in a cohesive soil where you’re counting on the structure of the soil to hold things together, the higher it gets, the flatter the stable slope is. And that’s what happened in Panama.

When they built the Panama Canal, they didn’t even know this. They learned. Some of the fundamental information on this came out of their experience. [John] Stevens and [Major General George W.] Goethals made certain estimates about the slope that would be stable and they dug the hole. What they didn’t realize was that it wasn’t stable. The rock wasn’t strong enough. Once they had dug the hole, they really had ruined it.

To try to illustrate, let’s say they used a slope of one vertical on two horizontal. Perhaps a stable slope would have been one vertical on six horizontal. Once it had failed, the stable slope was one vertical on twenty horizontal. Once you dug it too steep and it failed, the soil would have lost its structure. Then it would take a very, very flat slope in order to get stability.

Take this over to the nuclear situation. When the explosion went off, you weren’t going to control the slope. It was going to make an initial hole based on the geometry of the emplacement. The issue was, depending upon the material, would this slope be stable, or would it collapse and the material in the lip all slide back into the hole? If it did, then the whole theory of nuclear excavation would have been vitiated because the theory was that you would use the force of the explosion to remove the dirt.

You weren't talking about a proposition where you were simply going to loosen the rock and later move it with earth-moving machinery. Where you were going to save money was that the force of the explosion was going to make a big enough hole that you would have to do nothing more. If you put the explosives in a row, they would make a clean ditch.

Nuclear excavation wasn't going to work unless it would make a clean hole, and that hole would be deep enough for the canal. That was a fundamental issue. The scientists knew nothing about this, but the minute the engineers got there—when I got there and Bill Wray and others—we immediately started raising this issue.

As it turned out, ultimately the study commission consulted some of the top soil mechanics people in the United States, including Arthur Casagrande and others. Their judgment was that, for much of the route in Panama—the Sasardi–Morti route—the soil was a clay shale in which a nuclear crater would not be stable. The experts would not support the proposition that nuclear explosions could be used.

The part through the continental divide was basalt. So there was much less question there. A nuclear crater in such volcanic rock would probably be stable. But the clay shale, which is a sedimentary rock and was the type of rock that had caused all the trouble in the present canal, occupied a long section of the valley where the canal was to be excavated.

There were a lot of safety issues, too. But just from a strictly engineering viewpoint, one of our concerns about the feasibility of the canal proved, at least for this particular route, to be well founded.

Q: Was it basically for engineering reasons that the project was abandoned, or that the nuclear aspect was abandoned?

A: That was the up-front reason given. By the time they substituted conventional excavation for nuclear excavation for the long stretch of clay shale on the nuclear route, the cost advantage wasn't anywhere near as great.

The other major thing was the whole problem of evacuating this area where this canal would be. We estimated there were at least 30,000 Indians living within the area which would have been severely impacted by these explosions—impacted as far as air blast, ground shock, and low-level radioactive debris.

The theory was that the explosions could be made clean enough that, while there would be a problem right at the time of the explosion, it would decay fairly quickly, and then it could be re-entered.

There were areas of several tens of thousands of square miles that were going to have to be evacuated at least temporarily. We estimated that there were 30,000 Indians living in this area. A solution was never devised for this. Of course, the bottom line was that the relations with Panama evolved. At the political level, you had a shift.

There were the riots in '64 when [Lyndon B.] Johnson first became President. Johnson, who was very anxious to be every bit as effective as his predecessor in the foreign affairs area, felt he had to do something. We got full support from Johnson for a policy that said that we were willing to change our treaty relationship with Panama because we were going to build a sea-level canal. This was all part of a package.

We came up with the notion, and they pursued this, of negotiating three new treaties with Panama. There would be a new treaty covering the present canal. There would be a new treaty covering our military rights—the stationing of our troops down there. And there would be a third new treaty which would cover the sea-level canal.

Assistant Secretary of State for Inter-American Affairs Tom Mann supported this. After a period of year or so, he was replaced in that position by the person who had been our ambassador to Panama. He took a totally different view of this.

Whereas Mann had felt that we should hold out the sea-level canal and the possibility of building it in other countries to keep Panama in line, the man who had been the ambassador to Panama and who succeeded Mann held the view that we owed it to Panama to redress all their grievances as the result of the unfair relationship that we had with them, extending back to the original treaty. He felt that it wasn't right for us to frighten them with the possibility that we'd pick up our marbles and build a canal someplace else.

The whole tenor of the thing changed. The whole concept that we were going to build a sea-level canal also got shunted aside, based on the point that the canal was Panama's biggest industry. If you built a sea-level canal there would be an unmanageable boom during the construction, followed by a catastrophic depression when the construction ended and there was nothing left to do but watch the ships sail by.

These political things that I've just described tended to eliminate the top-level interest in the sea-level canal as a mechanism for solving the political problem. It was seen as more of a trouble than an aid.

When that was coupled with the technical difficulties, the whole idea went away. One other technical difficulty that deserves to be mentioned is that we learned much more about the transmission of disturbances in the ground from nuclear explosions.

That came about because the detection of underground testing was a very important issue. As soon as we had concluded the limited test ban treaty, people who were concerned with arms control wanted to pursue elimination of underground testing. A big issue on verification became whether it was possible to conduct underground explosions in a clandestine manner so that the other side couldn't detect them.

They came up with the idea, which was proved correct, that, if the explosion was detonated in a cavity underground, there was a decoupling effect, as compared to packing it simply in a small hole.

They did a whole series of chemical tests in the salt domes in Mississippi. They even did a nuclear test down there where they built a large cavity in salt. They did this with solution mining. They used water to wash out this cavity. Then they suspended explosives in the middle of these cavities, set them off, and measured the seismic effects.

As a result of these tests, they learned a great deal about how seismic shock from nuclear explosions is transmitted in the ground. They concluded that if we dug this canal on the Sasardi–Morti route, east of Panama, the ground shock at Panama City was going to be ten times what we had estimated it would be when we first studied it back in '59 and '60. If you look at the condition of Panama City, that meant that there was going to be a tremendous amount of damage.

There was a whole string of things here that fit together. But I think the really important thing was the politics. It just didn't fit in. Of course, we finally resolved the political problem with a new treaty. Probably, as far as mankind is concerned, we are better off to have done what we did than to try to have built a sea-level canal. I think a sea-level canal in Panama would have been a failure financially.

Q: When you left the cratering group to go to the War College in '64—

A: This thing was still going on then. I've jumped ahead in the chronology here because when I was at the War College, this was still going on. I wrote a paper at the War College. My treatise was on the subject of the terms that might be appropriate if we were to have a nuclear canal.

That paper addressed what would be the mechanics of having a canal, and if this was the way that it was all going to work, what sort of a treaty structure or management structure might you set up that would take advantage of and make allowance for the situation? This was quite an idealistic paper because it talked about international authorities and so forth and so on. I learned later, as we got further into this, that the last thing Panama wanted was any kind of international authority.

The Panamanians wanted a bilateral relationship where they could pull the chain of the United States every time anything didn't suit them. If they got a multinational authority, then that would be intractable, and Panama would lose leverage.

Q: So the canal story played itself out when you were finished with the War College and you were in the Office of the Secretary of the Army?

A: Precisely. That is when the Johnson administration embarked on a negotiation with the Robles regime in Panama aimed at trying to make these treaties and solve the problems that came to a head when there were the riots in 1964. That's when the events that I was just describing took place.

When I came out of the War College, I went into the Office of the Deputy Under Secretary of the Army for International Affairs. For most of that time, this was Thaddeus Holt, a man whom I enjoyed working for very much and who is now one of



Thaddeus Holt, Deputy Under Secretary of the Army (Internal Affairs), Mrs. Graves, Colonel Graves being congratulated on his promotion by Ralph, Robert, William, and Emily Graves.

my good friends. I see him quite a bit, although not as often as I'd like because now he's up in New York.

We had this negotiation. The head negotiator for the United States was the same Robert Anderson that headed the study commission. His deputy was John Erwin, who has held various senior jobs in the State Department, including Deputy Secretary of State.

Jack Erwin was negotiating with the Panamanian team. I was the Defense representative, but I did not sit in on negotiations. Erwin would meet with us almost every day, go over various points, and ask us to come back to him with solutions.

An Air Force lawyer, Bernie Ramundo, from the Office of the Secretary of Defense, worked on base rights issues. His contribution was all the rights we should retain for our military that are stationed in Panama.

My contribution was all the things that we should do as far as this new canal. A number of State Department people were involved.

We drafted treaties, and we spent a lot of time getting the Joint Chiefs of Staff [JCS] to address these treaty issues. I remember the Chief of Naval Operations really cared about only one thing, and that was whether we'd be allowed to continue flying the American flag. We could never get him to focus on some of the more complex issues, such as the right of passage through the canal.

The Montreux Convention governs the use of the Suez Canal by various types of ships, including ships of war. The Montreux Convention was not then the exact regime that controlled the Panama Canal. The treaty provided that the United States would have priority on use of the canal. Of course, during World War II, we didn't pay any attention to any of this stuff. We used the canal exclusively, and nobody else came near it.

But if you were going into a regime where you were going to share control with Panama, then you had to be more concerned about the use of the canal by our Navy and allied navies, and possibly by hostile navies, as well.

This was one of the things we were working on: what would be said in this treaty about who could use the canal and when and so forth? There were some people in the Navy who were concerned about that. But the main thing I remember is that we spent inordinate amounts of time talking about whose flag would fly. The issue for the Panamanians was it was going to be their flag. That was a big waste of time, in my opinion.

I learned a lot in that period. I spent a lot of time working on treaty language. I wrote a draft of a whole treaty governing a sea-level canal which I thought was very cleverly devised because it was like an option. We had a big argument about how to write a sea-level treaty which would give us the right to build a sea-level canal, but wouldn't obligate us to build a sea-level canal. I came up with a treaty worded something the way an option would be worded in business.

I remember that Stanley Resor was the Secretary of the Army. He was a corporate lawyer in private life. I explained to him that this was like an option, and he immediately understood that. But we couldn't get the State Department to understand it.

Q: Are there special problems involved in working with the State Department?

A: They have their own view of things.

I've got a lot of friends in the State Department, and I have worked with them a lot. They're always more interested in reaching an agreement than the people from the other departments.

The Defense Department or the Army Corps of Engineers or you-name-it is more interested in the substance; and the State Department is more interested in agreeing with people, figuring you can work out the substance so long as there's agreement.

Any time you get into a negotiation, they want you to give in on your cherished points so that you can get agreement. I'm not saying that they don't want an agreement favorable to the United States. But if you've ever been involved in negotiations, the closer you get to the end, the more they're willing to give up everything in order to bring home an agreement.

This was one of the big issues on SALT II [strategic arms limitation talks]—that in the interest of getting agreement, we gave away too much. There will always be this difference of views in any important negotiation.

Q: With the Panamanian negotiations, there was no treaty signed?

A: No. The Robles administration first and then the Johnson administration got involved in an election. Also, in this country, Vietnam tended to preempt other issues.

The thing really disappeared first because there was an election in Panama. The canal became the central issue in any election. The closer you came to the election, the more the opposing parties said Robles was not demanding tough enough terms. So basically, they folded their tents.

Executive to the Secretary of the Army, 1967–1968

Q: You stayed in the Pentagon when this—

A: Before that happened, stemming from my contacts with him on this Panama problem, Stanley Resor decided he would like to have me come into his office as his exec. His exec at the time was to go to command a unit and actually went to command the 6th Cavalry Regiment at Fort Meade [Maryland]. He needed to replace this man, [Colonel] Clay Gompf.

My friend, [Lieutenant General Richard H.] Dick Groves, the son of the general we've talked of earlier, who then worked in Resor's office, tells this story. They would have meetings about who to get to replace Gompf. Resor would say, "I want somebody like Ernie Graves." Then they'd go out hunting. According to Groves, after this had been going on for a month, he said, "Well, why don't you get Ernie Graves?" So they got me.

Q: I've got a lot of neighbors who work in the Pentagon—lieutenant colonels and colonels in the Army and Air Force and commanders and captains in the Navy. And I want to read you this quotation from Major General [William A.] Bill Carter, from his interview, because I think my neighbors bear it out, but I'm interested in your reaction. General Carter said, "At the Pentagon, you always work night and day. It doesn't make a difference whether there's a war or not. They generate their wars."

A: Well, that's true, although it happened that when I was there, in the areas in which I worked, in one case there was a real issue with Panama, which was not trivial; and in the other case, we were in a war with Vietnam.

So he's right. The JCS involvement with this Panama negotiation was an example of that, where there were issues that weren't that important, but that consumed a lot of time.

On the other hand, it would be a mistake to say that all the time consumed in that negotiation was over a trivial issue. There was a fundamental conflict between the United States and Panama over our, if you will, colonial position in their country, on the one hand, and domestically, the view that the Panama Canal was a vital utility to the United States and we should not allow a small country to dictate to us the policy and operations affecting this utility. So that was a real issue.

As far as the Vietnam War is concerned, I was in Resor's office during the Tet offensive. I was there during the famous—or infamous—squabble over the intelligence,

which is now being tried in New York between [General William C.] Westmoreland and CBS. I was there during the deliberations on the last major request for troop reinforcement made by Westmoreland. He came in with this request. We worked on it some. The papers were sent over to the White House in draft. They came back, and it was then not announced and the position was taken that there hadn't been any request.

After the Tet offensive, MACV [Military Assistance Command, Vietnam] took the position that if they were going to deal more effectively with the insurgency, they needed more effort. There was a review of policy in Washington, and basically they decided that they weren't going to put any more effort in. In fact, they were going to start scaling our effort back. They were going to have Vietnamization.

This took place over time. The involvement of Resor in all of this was to provide [Secretary of Defense Robert S.] MacNamara accurate estimates of just what it would take to do it.

In trying to generate resources for Vietnam—I don't mean dollars; I mean trained people, equipment, and so forth—the Army was handicapped by the magnitude of the job. But they were also severely handicapped by very antiquated, slow analytical tools.

If you asked the Army staff in those days to come up with a plan for putting more troops in Vietnam, where they would get the troops from, what would be the impact on readiness, and what would be the impact on our posture in Europe, it would take weeks. It was a great drill, most of which was manual.

Those are things that could be done today with a computer in a week. In those days, they were taking a couple of months. They were trying to use computers, but they were having a terrible time with the data.

For example, they had a master list of units, but they couldn't get the computer to print a list that was accurate. It was full of mistakes. They were trying to get master lists of equipment, and they couldn't come up with that, where it was and how much. All that's come a long way since then. But computers were in their early stages then, and they couldn't marshal data quickly.

Another insight into that same kind of problem—but also different—they didn't know the strength of the Army. You may say, "How in the world?" But there was a dispute between OSD [Office of the Secretary of Defense] and the Army of about ten thousand people.

Why was this? Because the Army determined its strength based on morning reports. You had losing and gaining units for every transfer. So Private Smith leaves Unit A to

go to Unit B. If you have a morning report every day and one unit lists him as departed and the other unit does not list him as arrived or picked up, then he's not on the rolls. In the morning report system, those things get corrected with time. If you looked back 30 days—that is, suppose on July 2, you asked what the strength of the Army is and it's some number. Then on August 1st, you asked what the strength was July 1st.

You found a huge difference by the time all the corrections had flowed in because of these problems of one unit having dropped a soldier and the other unit not having picked him up. Thirty days later such mistakes disappeared because one or the other or both units have sent in corrections.

This is just a slight insight into the kind of problems which occupied Resor. He was very interested in this. MacNamara, of course, with his management style, wanted to get all this right.

One of the amusing events that happened in the middle of all this was a squabble over what size the Army should be—not what the size was, but what strength should be authorized. MacNamara said that authorization should be controlled within plus-or-minus 50 people. Here we were. We didn't know how many people there were to the nearest ten thousand. Yet MacNamara was insisting that it all be controlled to 50. In my opinion, this epitomizes his failure as the Secretary of Defense. He was worrying about this type of thing, and he lost the war.

Q: Should Stanley Resor have worried about counting from morning reports as the Secretary of the Army?

A: In my opinion, Resor was doing what he had to do because he worked for a Secretary of Defense that was preoccupied with these things. Among the many reasons that we lost the Vietnam War was that the leadership of the country—and I'm thinking of President Johnson and Robert MacNamara, Secretary of Defense—knew very little about war.

Imagine a war—General Bruce Palmer called it the 25 Years' War—a war that went on for 25 years, and every year the budget was made up on the assumption that the war would end on the last day of that year. They didn't want any bullets left over because of all the waste after World War II from the surpluses. We didn't want to have that in Vietnam. How do you think the waste after World War II compares with the waste of Vietnam?

Here were guys worrying about these details. It was a paradox because MacNamara would say over and over again, "We can afford whatever it takes to have a strong

defense.” That was always his pitch. But he didn’t want us to be wasteful, to have more than we needed.

The issue was to be careful in what we needed. But the point is, he didn’t know much, because we lost.

Q: Is that what you were primarily concerned with when you were in Resor’s office? Is that what you worked with primarily?

A: The whole matter of managing the Vietnam War was the top subject. Of course, the Secretary of the Army gets into a lot of things. Incidentally, he didn’t get into civil works. In those days, the General Counsel handled that. Al Fitt handled that. Resor had almost nothing to do with it.

It was amusing because, later on, there was a huge court suit over the Tennessee–Tombigbee Canal. Resor had signed a paper respecting the authorization, and there was a big issue about whether he exceeded his authority. I was actually in the Secretary of the Army’s office at the time this took place. Either Al Fitt or his successor, Bob Jordan, was handling it.

I remember that Resor put his mind to it. They took care of it in less than an hour, as I remember. That was nothing compared to issues like ammunition supply for Vietnam or personnel, where Resor would work on the problems for months to get them right. His focus was on the war, properly, and not on these other things.

Q: And so was yours?

A: And mine was, too.

Another issue at the time was the issue of ballistic missile defense. Allen Enthoven, the Army, and others were looking at what would be the effectiveness or ineffectiveness of a ballistic missile defense.

In September of 1967 MacNamara made his famous speech announcing that we were going to proceed with an ABM [antiballistic missile] system. That was a political decision because MacNamara and his whole crew were violently opposed to this. But President Johnson decided to go ahead with deployment. The result was the ABM treaty with the Soviet Union. In spite of the bias of MacNamara against this, it was a good decision.

You are seeing a replay of these two sides now in President [Ronald R.] Reagan’s Strategic Defense Initiative [SDI]. You can get out the articles and look down the

roster. The same set of people that were violently opposed to the ABM deployment in the '60s are now violently opposed to the SDI. On the other side, it's pretty much the same. That isn't to say that the SDI is right—only to say that the same sets of people are involved. The views that led to these two sides are enduring in America, and it's the same cast of characters.

Q: Do you envision a similar evolution towards another treaty, another agreement?

A: Well, of course, that's what's going on.

Commander, 34th Engineer Group, 1968–1969

Q: You went to Vietnam from the Secretary's office.

A: Yes.

Q: How much confidence could you have had going to command in Vietnam having seen what went on in the Pentagon?

A: That's interesting. I wasn't as concerned about the lack of support for our effort over there. When you get right down to it, we lavished support on Vietnam. It was the best supported war that any country has ever fought.

As we were talking earlier, I said it was wasteful in the lavishness of the support. We should have fought it on a more austere basis and we would have done better.

I was a little apprehensive about how well I would do as a commander there. I had been with the 44th Engineers in 1958 and '59. It had been ten years. The job of troop leading in Vietnam I perceived to be quite different from the kinds of leadership that I had been exercising in the States in that intervening period.

One thing happened, though, that helped. When Stanley Resor made his annual trip to Vietnam in July of that year, I went with him. We went everywhere. We visited every division. There were seven divisions.

I remember particularly our visit to the 1st ARVN [Army of the Republic of Vietnam] Division, which was up in the I Corps area on the border with North Vietnam. But we went all over, were briefed by every division, saw every type of unit, and observed some outstanding exercises.

That was invaluable to me in getting an insight about how they were doing things. I have always concerned myself with this question: how does what you are doing stack up with what can and should be done? How can you know the answer to this question?

I'm not talking about "efficiency." But if you're out there with a bunch of men, nothing human is perfect. In fact, everything human is quite imperfect. You don't know what standards you should be trying to achieve. If nobody is shaving, should they be shaving or not? You may say, "Well, hell, if you were a good commander, you would know."

Q: You confronted that in the 1282d.

A: Right, the same problem. It's endless. How do you know? You shouldn't be draining the energy of your people doing a lot of stuff that's a trial to them if it's not contributing to doing better.

A lot of the things we do in military discipline are done because they create a frame of mind and an esprit which produces results. We put everybody in the same uniform and make them cut their hair. We do all these things because the personal discipline involved in these things produces a better effort than if everybody is allowed to lie around sloppy.

History has proven that. You can go back to Alexander or you-name-it. You can read about it in the Bible. We know from human affairs that this is the case. But that doesn't necessarily solve the problem for the commander on the ground at a particular time. What things are important? What standards need to be achieved?

Some things are easy. You're not going to lie and cheat. You don't want rapes. You don't want automobile accidents. Some things you know. But there are a lot of more subtle things that you don't know.

Maybe you're so preoccupied with the lying, cheating, rapes, drugs, and automobile accidents, that you never get around to the refinements. People have argued that that was the case in Vietnam.

Q: It's certainly possible.

A: In the 34th Engineer Group, when I was there, that was not the case. We had some chance to make judgments about what was important and what wasn't.

Heading over there, I had this thought, although I had come out of my command of the 44th Engineers with a pretty good idea about what you should and should not do. But after all, that was after I had been in Korea a year. I wasn't worried about how things

were going to be going after I'd been there two or three months. What I was worried about was what I should do when I got there, that first month?

By going with Resor to Vietnam and seeing what they were doing, I could make good use of the month that intervened between that trip and my own deployment thinking through what I was going to do.

Q: You were in the Mekong Delta the whole time you were there?

A: I was in the delta. When I arrived, the headquarters was at Vung Tau, which is not really down in the delta, but then it moved down to Can Tho.

Q: And was your major project the 9th Infantry Division's headquarters?

A: Dong Tam consumed the most effort, but the other big job was the rebuilding of QL-4, the main highway which winds from Saigon down into the delta, really down to the very tip of the peninsula. It takes a circuitous route since it will run along the bank of one of the branches of the Mekong River, and then it will cross and so forth. We were trying to rebuild that road all the way down, partly as a supply route for ourselves, but really to encourage commerce, movement by the Vietnamese. That was the more interesting job from an engineering viewpoint because there was one narrow stretch that was built beside a canal.

Most of the roads in Vietnam are beside canals because it was the spoil from the excavation of the canal that provided the fill on which the road rested. But the roads were very narrow because on part of this fill, people built their houses. You had this fill, you had the houses, and then between the houses and the canal was a road.

For one stretch, which was about ten kilometers, we decided to abandon the route and strike out across the rice paddies, build a fill, and use clay-lime stabilization on this fill. Scientists had found that if you mixed lime with that clay, it would stabilize the clay and make it strong.



Colonel Graves takes command of the 34th Engineer Group at Vung Tau, Republic of Vietnam, from Colonel William G. Stewart.

This was quite an engineering job. It was taken on primarily by the 36th Engineer Battalion, commanded first by [Colonel Richard E.] Rich Leonard and then [Colonel Vito D.] Vic Stipo. The driving force behind this concept was [Colonel Fletcher H.] Bud Griffis, who is now the district engineer in New York. He was quite an engineer. He was a major at the time. He started out in the headquarters in Saigon doing planning and design work. About half way through his tour, he was reassigned and became the S-3 of the 36th Engineers.

The great disappointment of all this was that we failed by about a hundred feet of closing this road during the dry season that I was there. We got rained out at the very end. We had the closing ceremony. [Major General Harold R.] Hal Parfitt, the 20th Engineer Brigade commander, and I went out there, got on a bulldozer, and pushed some dirt into the gap. It started pouring rain while we were in the midst of the ceremony. They never had enough dry days to close the gap that year. They closed it the next year.

Q: Did you experience active opposition to this project?

A: Oh, yes. Of course, in Vietnam, most of the action was at night. We never had anything happen during the day that I can remember. There may have been some people around that we didn't approve of. But at night equipment would be sabotaged. We had casualties from mines that were put in at night. They would come in and mine work areas with antipersonnel mines. We had some people killed that way.

The 69th Engineer Battalion was building the road from the south. The commander of their forward company was killed. To secure their equipment out on the job, rather than moving it back and forth every day, they had built a small area, put up a berm, put their equipment inside there, and dug some shallow shelters against being mortared—a frequent occurrence. This particular night the company commander didn't get in his shelter. He was sleeping in his jeep, the place was mortared, and he was killed.

That was a constant concern in Vietnam. That's an example of the "standards" issue that we discussed earlier. What standard should be established for security? It was a difficult issue because if you were going to insist that all these units be bunkered so that they were highly secure against being mortared at night, that would have consumed a tremendous amount of effort.

There had to be a judgment made as to how much effort went into security, and how much effort went into the job. In this particular case, we didn't get it right, and the result was tragic. This was a constant concern.

Q: Did you get involved in the revolutionary development program?

A: Not really. Our main contacts were with the local Vietnamese concerning security and our construction work. For example, we had to deal with them about their flooding of their rice paddies along the route of this road project.

We couldn't solve the secret of the overall drainage. We had to try to get the local Vietnamese authorities to help us to keep these rice farmers from flooding us out. We had some success in that, working through the Vietnamese provincial officers.

We did work with Vietnamese engineer units. When Vietnamization got going strong, we turned equipment over to them. I remember we got an order to turn a rock crusher over to them. That was quite traumatic because we had been struggling to get our own rock crushing capabilities up. We had to divert a lot of effort to get a crusher ready to transfer. We sent people down into the delta with this machine to help the Vietnamese set it up and operate it. But as far as the other work was concerned, no. Not to any great extent.

I should mention rock crushing as another big preoccupation. There was a large quarry at Vung Tau, which was operated by the 36th Engineer Battalion and a quarry company. The 36th Engineers moved out of Vung Tau down to Vinh Long. The quarry company was left behind. We managed to triple the production out of this quarry. It took some pretty tough dealing with people. We relieved one company commander.

Q: It was just generally a question of creating a sense of urgency?

A: Yes, and getting them organized. The thing that frustrated me—had before and has since—is that the managers didn't seem to be very tough-minded about what had to be done.

If equipment went down, everybody would say, "Well, I guess that's all for today. We'll go home." My attitude was that since the only thing that counted in any quarry was the equipment, when any machine was down, you worked on it 24 hours a day until it was fixed.

We had things that wore out, but we never seemed to have the replacements in time. We had a cone crusher, which is a very fine piece of equipment. Shortly after I got there, the cone wore through, which happens. So I said, "Well, have we a replacement cone?" No. So we ordered one. That crusher sat there for a month and a half while we got a cone. Soon after I asked, "Have we ordered a replacement cone for this one?" No. Then we had quite a scene.

Finally, by the time I got ready to leave, the cone wore through again, which was not unreasonable. And by golly, we did have a replacement when it wore through. But can

you imagine having your entire operation dependent on something that wears out every two or three months and not having a replacement on hand?

Q: It's ridiculous, of course.

A: That's what I mean about being tough-minded about things. If you have a job to do, sit down and figure out what's critical about it and make damn sure that those critical items are taken care of.

I'll give you another example. When we were working on this QL-4 job, we had all these bulldozers down in the mud. We had terrible troubles with the buildup of this mud on the machines affecting the cooling of the engines. The front of the dozer, where the air for cooling reaches the radiator, would get all caked with mud, and then you wouldn't get cooling. The engines would overheat and you'd have failures, bearings and everything, and the whole engine would have to be changed out.

The answer was to have a regular drill to clean the radiator screen. That means somebody has to get off a comfortable seat, get his feet dirty, and get in there with a shovel and work for half-an-hour to clean away the caked mud.

That's just a question of who's in charge of this operation. We had a lot of trouble with that. Maybe I was too hard, but my attitude was, the ultimate measure of these commanders was whether they could get these things done or not.

Q: That probably wasn't the only special problem in maintenance that the delta imposed on you.

A: It was tough going in the mud, particularly the whole problem of working on the equipment when everything was muddy and dirty. It wasn't cold. I can say that for it. But other than that, it was a very adverse environment.

Some of the commanders had what it took. Some didn't. When [Lieutenant Colonel John J.] Jack Plunkett assumed command of the 93d Engineers—

Q: Was that one of your battalions?

A: One of my battalions. Things were in a deplorable state. By golly, after he'd been there two months, he had everything working. He put in a fine maintenance program. He was living proof that you can do it if you put your mind to it. He was blessed with a somewhat lighter construction workload. But nevertheless, watching him do this convinced me, if you're in command of something, you have to decide what's important and get it done.

Q: Was RMK [Raymond International and Morrison–Knudsen] still active in Vietnam?

A: Very. We interfaced with them some. Of course, they furnished us a lot of rock.

Most of the rock had to be moved to the delta by barge. They had a quarry in Saigon which would load out rock. We had a “delta rock plan” which involved who would produce the rock and how much would move by barge to which locations.

I had a port construction company that built most of the rock piers in the delta. When the barges would come alongside, we’d move a crane to the pier, and unload the rock from the barge onto trucks. The pier on the riverside from which to do this was built by us.

We interfaced with RMK’s quarry. RMK was also down in the delta building things. For example, when we moved down to Can Tho, we went into an area called Binh Tuy. RMK was building a logistic installation there next to Can Tho.

We were allocated a piece of real estate in this area. We built our own buildings for the headquarters using essentially the same design as those being built by RMK.

Q: How good was their work overall?

A: Good. Certainly better than the troop work. They had tradesmen who were skilled journeymen. And they had access to the supplies. We would get basic things, but special things we couldn’t get.

Q: They made a lot of money, those guys.

A: I’m sure it was expensive. I’m not familiar with any of the administration of it.

Q: What do you think about the idea of a contractor doing construction in the theater of operations like that, alongside of troops? Did it work out okay?

A: I think, by and large, it did. We were amazed at some of the areas they were working in. We worked on the southern part of QL–4. They worked on the section north of us, between where we were and Saigon.

Evidently, they were paying people off or something, because they were able to leave their equipment out. This was something we were always assessing, because, if you had to take all your equipment in every night, that was very time consuming. So we asked how they were doing it, but never received a real answer. We were convinced they were

paying somebody off, because they left stuff out unattended, and it didn't get sabotaged or stolen.

I guess if you examine the division of work between troops and contractors carefully, you could probably argue that some of the work was malassigned. But I think, overall, the concept of having them over there was good. At least if you've decided to have a certain level. I personally think that we went overboard in a lot of the support arrangements we made out there.

Q: That we overbuilt for our own forces, you mean?

A: Right. Up at An Khe they built an incredible cantonment for the 1st Cavalry Division. About the time they got it finished, the 1st Cav went south and never went back. I think a careful analysis of all the different division cantonments that were made would show that it was mostly a waste of effort.

Q: Did you ever look at [Major] General [Robert R.] Ploger's book² on U.S. Army engineers in Vietnam?

A: Only briefly.

Q: I just wanted to ask you about what he identified as the major problems for engineers—unstable soil, which you talked about—the mud, and the lack of building materials. Do you more or less agree with that?

A: I would agree with that, although it seems to me that the soil conditions when I was there were far more important.

An amusing contrast—when I was in Korea, my battalion was right next to the engineer depot, and I had a tremendous advantage over the other two battalions of the 2d Engineer Group—the 76th and the 802d—because I could get stuff and they couldn't. When I got to Vietnam, my group, the 34th Engineers, was down in the delta, whereas the 79th Group and the 159th Group were up much closer.

The 159th was in Long Binh. They were right next to the supplies. And the 79th was in Bien Hoa, so it was fairly close. I was at the other end of nowhere. I did have a liaison officer up in Long Binh working the supply problem.

²Major General Robert R. Ploger, *Vietnam Studies: U.S. Army Engineers 1965–1970* (Washington, D.C.: Department of the Army, 1974, 1989).

So, yes, there was a problem. But again, what I found when I arrived at the group was that there was not good planning. We would get a construction directive, and the battalion wouldn't get around to ordering materials. I worked mightily while I was there to get that squared away. My instructions were, "The minute we get a directive, the first thing we're going to do is make up the requisitions for the material."

Even so, there were delays. Certainly supplies affected my operation. But whether at the theater level by that late date there was really a problem, I doubt. I remember General [Frank T.] Mildren complaining that there were thousands of telephone poles in the depot—well, they weren't telephone poles. They were piles. They proceeded to issue them for anything and everything. Of course, in very little time, there weren't enough piles. This showed that Mildren really knew very little about logistics.

Q: I remember walking in Saigon port in 1967 and seeing big stacks of plywood rotting on the docks, not being moved to a depot, not being used. I also think, on a theater level, even earlier, supplies probably were adequate. They were in the country.

A: Getting them out to the jobs was a problem. I would argue that Bob Ploger was speaking a truism when he said that supplies were a problem in war. You show me a war where supplies weren't a problem and I'll show you something that wasn't really a war.

Perhaps the problem in Vietnam was that since we did everything on such a lavish scale, we overloaded the system. If we had tried to do things more austere, we might not have had as many problems as we did.

Q: Nobody was building to your father's standard?

A: Absolutely not.

Q: I was going to, in fact, ask you if we shouldn't turn Ploger's observation on its head and say, profligacy of supplies was a problem.

A: It may have been. There have been some very excellent books written about what we did and the mechanics of it. I have yet to see a book that is written about logistics in the larger context.

Of course, Carroll Dunn wrote a monograph as well.³

³Carroll H. Dunn, *Base Development in South Vietnam 1965–1970* (Washington, D.C.: Department of the Army, 1972).

Q: That's right.

A: There's a lot of good material in there on how you do things, and what was done right and what was done wrong. But I don't think either Bob Ploger or Carroll Dunn presumed to write on the larger issue as to whether we should have had a completely different approach to the level of things, on the basis that since the troops were only going to be in this place for a year, they could have put up with a lot tougher situation than we tried to provide.

Q: Is that your own personal viewpoint?

A: Well, it is. I'll give you an example of what happened in the 9th Division which illustrates this.

They had the concept for Dong Tam, and tremendous effort went into this. Tremendous effort went into things like the TOC—tactical operations center—which was a really fine bunker. Tremendous effort went into the officers club. They flew in electrical fixtures from Hong Kong and everything else.

The brigades of the 9th Division that were the cutting edge of this operation were almost never in Dong Tam. Toward the end, they shifted the whole construction effort to building fire bases out where they operated to provide more secure places for the troops to stay during operations and when they were having short stand-downs.

They went away from the notion that they were going to stand down the battalions in Dong Tam. Basically, I think it was a question, to an extent, of efficiency. If they made more secure places for them out where they were operating, made these bases a little more livable, instead of having them just plain mud holes, if the troops could stay out there, a lot less effort was spent moving them back and forth.

All I'm arguing is, if a person is going to be somewhere for only a year and he's kept busy and he is well led, you don't have to have much luxury. You can get by.

Dong Tam required a high-voltage electrical system. It was a real chore because we didn't have the people that knew how to do this high-voltage electrical work. The generators were a difficulty because they complicated things, and so forth and so on.

There was a high-voltage detachment which had some skilled people in it, but we had only one-tenth the people to do this high-voltage work that we needed to get the job done in any reasonable length of time.

True, if we were planning to be there for ten years—and we certainly should have planned to be there for ten years—some stuff should have been put in. But there was a lot of stuff that should not have been put in.

This is just a logistician speaking. But it's my view of a mistake we made.

Q: This is a period of some pretty significant racial tension in the American units in Vietnam.

A: I don't remember that being a problem. I don't mean we had no cases. But I didn't sense that there was a real problem with race relations. I don't remember riots or any incidents where we had a shoot-out between different people and so forth. We had some very fine black officers and black NCOs and black enlisted men in our units. I don't remember anybody making a big thing about it. I think integration was working, as I remember it.

Q: What about drugs?

A: Well, this will ever be a mystery of my life because I've read so much about the drug problems in Vietnam. We certainly had people on drugs. At least, we had accidents that were traced to drugs. But I don't recall—and I will ever wonder if I was just ignorant of what was going on—that drugs were a major problem in the 34th Engineer Group.

Let's be clear on the time. This was September of '68 to August of '69. I doubt if drugs were any more of a problem than alcohol in the 34th Engineer Group. You always have the drunks that cause problems.

Q: The Army provides cheap booze.

A: This is somewhat of an opiate that goes on. I'm not against drinking, but you get problems with accidents and other problems that stem from drinking—fights and so forth. I'm not aware that drugs were a big issue in the 34th Group.

Q: We were talking about standards earlier. So you weren't distracted by this kind of stuff.

A: That's the point. Having read about all of it since, then the question comes up, Jiminey, do you mean to say that all this was going on and I never knew about it? There's no way to tell.

I've seen quite a few of the people I served with on various occasions since. [Lieutenant General Ernest D.] Ernie Peixotto, who commanded the 86th Engineers, and [Colonel Clyde A.] Pete Selleck, who preceded him. My deputy, Dick Lawrence, I've seen since.

I can't remember that any of us thought that we had a huge drug problem. They can tell some real hair-raising stories about incidents, but that's different from the situation where you had a high percentage of the people on drugs.

Q: Is there anything else I ought to ask you about Vietnam?

A: I don't believe so. You talk about whether you're sorry to leave or not. I wasn't sorry to leave Vietnam, but for some funny reasons.

In the delta, a commander could get things done if he could get around. We had a terrible reduction in helicopter support toward the end. I got sort of housebound, so to speak. There were only so many helicopters, and I insisted that my subordinate commanders have them, rather than me. That was something that we went through cycles on. First, we had helicopters. Then they'd wear out. Then there'd be new ones, and so forth. There was a lot of turbulence in the helicopter area which affected the exercise of command. That was one point.

The second point was that they started to wind the war down. The 86th Engineers was inactivated, and the 9th Division started to be inactivated. Since we had decided to pull out, it didn't bother me to come home.

Again, I learned a lot from Vietnam. I think I had a successful tour there. I was left with my command for the entire time. Others were rotated. Some people had command for only six months. I was left down there for a year. My judgment was that the units responded to my leadership. So all in all, it was a good experience.

Q: You were a colonel?

A: I was a colonel.

Q: Did you know you were on a list for promotion before you came home?

A: No, I didn't know that. I was very concerned about getting my report in for my command because the board was meeting as I was coming home, or met just after I came home.

Deputy Director of Military Construction, 1969–1970

Q: You knew you were going to OCE?

A: I had been ordered to go in as the deputy director of Military Construction. I was anxious to get promoted. I didn't know then what I know now about the way the system works. If I had, I probably wouldn't have been as worried about that one efficiency report as I was. But I had not been promoted the year before, even though Stanley Resor had written some very good reports and he had done everything he could to assure that I would get favorable consideration.

But the attitude of the president of the board, [Lieutenant General Stanley R.] Swede Larsen, was if you hadn't served in Vietnam you weren't qualified. The same view prevailed in the board that selected me. If you hadn't served in Vietnam, you basically weren't qualified—which is a little tough because there were a few people that, through the evolution of assignments, didn't get command in Vietnam.

Q: If they'd had that attitude after Korea, you would have been at a dead end.

A: That's right. But my number was up. I think my report did get there.

Q: You came back from Vietnam in August of 1969?

A: Yes.

Q: And went to OCE?

A: That's right. I was assigned as the deputy director of Military Construction.

Q: That's your first job in the headquarters?

A: That's right. [Major] General [Daniel A.] Dan Raymond was the Director of Military Construction at the time. General Carroll Dunn had been the Director of Military Construction, and he'd moved up to Deputy Chief of Engineers.

Q: Were you doing some other job at the same time at NASA [National Aeronautics and Space Administration]?

A: My job was really a three-hatted job in this respect. The deputy director of Military Construction also had a title as the OCE representative for construction for NASA.

That program was nearing its end when I arrived, as a matter of fact. It had been much bigger. [Major] General [William L.] Bill Starnes had been the deputy director of Military Construction. He had, during his tour, been very much involved in the construction for NASA, particularly the facilities that were built at Cape Canaveral.

Earlier he'd been down there as the district engineer of the Canaveral District when they were building the vertical assembly building. When he was the deputy director of Military Construction, he was the focal point for the direction of the work that the Corps was doing for NASA.

By the time I arrived, the work at Canaveral was pretty well completed. In fact, we faced the issue of closing the Canaveral District and having that work taken over, as I recall, by Jacksonville.

Canaveral had been a separate district, but it had shrunk to fewer than 50 people. Maintaining its separate status really didn't make any sense unless there were plans for doing a lot more work in the future. We determined in consultation with NASA that that was unlikely.

NASA had some more work ahead. But by that stage, rather than relying on the Corps, they were going to do it under their own management.

The other big issue concerned the construction of a research center in Massachusetts, a big building in Cambridge, for NASA. The building was fairly far along, but they still had not decided on all the internal utilities. There was one floor—or two—that was going to have a lot of utilities because it was going to be used for laboratory work. I remember going up to Boston to try to help resolve exactly what the requirements were to be because there was a lead time on getting all the material for this special laboratory work.

Right in the midst of all this, NASA decided to discontinue the project because of money. They decided to finish the building without any of this special stuff and turn the building over to GSA [General Services Administration], which would use it for offices.

These two examples illustrate that the NASA thing was phasing down during the time that I was there.

Q: So it was more a question of the program coming to a conclusion than NASA wanting to do its own work?

A: Yes, it was more that it was coming to a conclusion. It was one thing when the volume was very high and they could turn over a big chunk of it to the Corps. But by that stage where there were just isolated projects, it didn't make sense for the Corps to maintain a big organization to do the work for NASA. So we phased it out.

Q: How would you characterize relations with NASA in those days? Were there a lot of complaints about high overhead?

A: It wasn't that bad, no. I think the relations were good. But since the program had contracted, they were concerned about costs. They were having to trim their efforts in order to provide full effort where they needed it. The net result was that they didn't think they should be paying for a large Corps establishment. Under the Corps' approach, if we had an office set up to support them, they were bearing the cost of it.

Q: That's right. All up-front costs. The NASA historians wrote a book called *Moon Port* about the Johnson Space Flight Center three or four years ago. We were kind of surprised that they only mentioned the Corps of Engineers twice in 400 pages, and we wondered if that reflected a long-standing animosity.

A: I don't think so. Of course, the best source of that kind of information would be people like [Major General Robert P.] Rip Young and Bill Starnes, who were very much involved. But I think generally the relationship was excellent. It's just that they didn't need us any more.

Q: What was General Raymond like?

A: General Raymond is a man I admire a great deal. He is very bright. He had a tremendous capacity for getting things done. He could make up his mind on things; he didn't waste time. He was an awfully nice guy, and he didn't get in fights with people unnecessarily. He was very straightforward. You knew where he stood on things. I enjoyed working for him. I learned a lot from him.

The most difficult thing that was going on, and the most important thing during the time that I was in military construction was the question of the Corps' S&A [supervision and administration] rate because it had crept up.

In the case of NASA, this was because we had a very small program. The smaller the program gets, the larger the overhead becomes relatively. You still have a district engineer, you still have a personnel officer, and you still have finance and accounting.

As you get quite small, supporting all these functions makes your overhead large in proportion to the work. This had happened throughout the military construction program. It was at a fairly low level—very low compared to what it is now, for example.

We had a nucleus of military construction in just about every district in the Corps, and we didn't have enough workload for that. [Lieutenant] General [Frederick J.] Clarke decided on a major redo of the Corps. I was put in charge of the work on this.

We studied the military workload and decided to remove military construction from about half the districts. It was a massive effort, as you can imagine, to determine what the space reductions were going to be.

Fortunately, to get the job done, there weren't as many procedural requirements back in the fall of '69 as there are today. I don't mean that we didn't have a program of keeping people informed.

But if you look at that situation today, you have to go through a tremendous drill if you're going to make major reductions or realignments of functions. You're even forced to do environmental impact statements in some cases, which is a ridiculous extension of the law. But the National Environmental Policy Act [NEPA] hadn't been passed at that time. It came along about then, but it hadn't taken effect in all the ways that grew out of litigation.

Q: It was the next year.

A: It was the following year. For that reason, we were able to go ahead and do this work.

Q: How did you approach the work? Was it through a committee?

A: Yes. You had participation of a group of people, such as the personnel office and the controller. The budget people from Military Construction and people from Civil Works also were represented.

There was a small nucleus within Military Construction which worked under my supervision. Everybody was into this—General Clarke, the Chief, the Deputy Chief, Raymond. The guy that was in direct charge of making sure that these charts were done right was myself.

We made a layout of the numbers. We had data on the number of people. We went through and said, if we eliminate the staff that deals with military construction in the Detroit District, then we can eliminate 20 spaces, for example.

We also studied the level of military construction in all the districts over the past and the number of people that it had taken to manage it. We studied the S&A rates to develop a curve that said how many people it ought to take, depending upon the construction workload. If the workload was 10 million a year, it would take so many people; 20, 40, and so on up.

Then we made projections of how large the workload was going to be. In that way, we were able to establish a relationship between the size of the workload and the number of people we had.

We tried to get down to only one district per division handling military construction. We didn't completely achieve that. But that was the goal. There were some particular cases where we didn't do that, mostly where the workload was very large.

Many of us agreed at the time that it would have been desirable not to do this because we wanted to be in a position to move people back and forth between civil works and military construction. We had this flexibility. But if you took military construction out of a district, then you no longer had this flexibility without moving people from district to district.

Talking to people just recently, the military construction program has grown tremendously, and the civil works program now, in the construction phase, is cut way back. So those districts that are now purely civil works have an overhead problem. In other words, they're more costly. I think perhaps some consideration has been given to reintroducing military construction into these same districts.

But back in 1969, to get the S&A rate down to five percent, the only solution was to take it out, which we did. And General Clarke was behind this all the way.

We also reduced the size of the Office of the Chief of Engineers in Military Construction. We took a great many spaces out. I was the one that had to make most of those decisions. I don't mean that they weren't confirmed by my superiors. But to decide the question of how many people each section should have, I went through and examined the information and put this all together.

Q: Those are not easy choices to make.

A: They weren't. It was tough. Most of these changes were by attrition. But there was a certain amount of moving people around.

Q: I know General Clarke had been concerned about the overhead issue for a long time because in the work in the Middle East, even in the mid-'60s when that program wasn't as dramatic as it later became, the S&A rate was always a ground for complaint.

A: That's correct. A very amusing thing happened in connection with this study. The work in Saudi Arabia was way down. That was being done by the Mediterranean Division, which was then in Italy. General Clarke suggested that we discontinue the work in

Saudi Arabia. We had proposed that. In fact, we had sent word to the division to report on just what savings there would be when we did this.

Our ambassador to Saudi Arabia at the time, Herman Eilts, got wind of this and sent in a message, I believe to his superiors in the State Department. There was probably an information copy to the Department of Defense. It said that under no circumstances should the Corps discontinue the construction in Saudi Arabia; that in his view, it was the program with the Saudis that had the most positive effect on our relations, and that it would be a very great mistake from the point of view of relations with Saudi Arabia to withdraw our support.

Of course, subsequent to that, the program underwent tremendous growth. Up to that time, we had done some good work, but it was nothing compared to what was done later.

It certainly debunks any notion that the Corps was self-seeking in its role in Saudi Arabia. The Chief of Engineers was ready to discontinue the whole effort, and he had to be persuaded by the Department of State to stay on.

Q: Of course, he didn't need it, but was there a lot of support for General Clarke's interest in closing that program down?

A: No, I don't think so. The attitude in most places in the Corps is not to want to shut things down, although this is an interesting point. Others might not completely agree with me.

I think with military officers in charge of the Corps, the leaders tend to be less influenced by the kind of self-protection that affects a civilian bureaucracy. Parkinson's law is less at work in the case of the military. They tend to be more oriented toward "what is the mission?" If there isn't anything to do, let's not waste money.

I don't mean that overall they don't want the Corps to be capable. The military leadership certainly is looking out for the long-term capabilities of the Corps. But they have a slightly different view of how that's done. I think their view of it is that, if the Corps is efficient and doesn't have a bloated bureaucracy, it will survive.

They don't want the Corps to be viewed as a bloated bureaucracy. They want it to be lean and mean. I think some of the top civilians in the Corps have the same attitude. But overall, I think any bureaucracy like that tends to be protective. So one thing that's helped the Corps change with the times is the fact that it had leaders that believed in change.

Maybe there were district engineers out there that hated to lose their military construction. They were probably prompted by their civilian staff as to all the reasons they should not do this. But I think the in the minds of the top leadership—Clarke, Dunn, Raymond, Graves—there was no question that this had to be done.

Q: I think you're right. In civil works, with the Environmental Advisory Board, I don't think civilian administrators would have been as successful in imposing such a change on a bureaucracy.

A: Clarke was one of the most clear-headed and far-sighted Chiefs we've had in a long time. He saw very clearly the things that had to be done to keep the Corps abreast of the times.

I want to mention one other thing about this S&A rate. To an extent, this was driven by the Air Force because we were engaged—and Raymond was very active in this—we were engaged in an intense debate with the Air Force as to the extent to which the Corps should do Air Force work. One of the arguments of the Air Force—that they should be allowed to do more of their own work and that the Corps should do less of their construction for them—was that our overhead rates were excessive, that we were charging them a lot of money, and that we were duplicating the work of the Air Force civil engineers.

In connection with their maintenance function, they had their civil engineers on every air base. It would be more efficient for them if they were allowed to contract for this construction, rather than using the Corps. Since we had a high S&A rate, it was easy for them to offer estimates that, in fact, it would be cheaper if we were no longer doing this.

But the people in the Office of the Secretary of Defense, generally, did not want to foster the development of a third construction service. They already had at that time the Corps of Engineers and the Bureau of Yards and Docks. They didn't feel they needed to build the Air Force up to the status of a third construction effort.

So they were on the side of the Corps, but every year there was a big adjudication as to the division of the work. The Air Force was allowed to do a certain amount itself. They would argue because of urgency or special requirements as to the projects that they sought. Then this would all be decided.

In order to get the Corps into a better posture for this, it was absolutely essential to get the S&A rate down.

Q: This controversy with the Air Force sounds very familiar.

A: That's gone on continually. Perhaps it's more embedded now than it was. It's depended on the personality of the top man in Air Force civil engineering.

The man at the time that I was in Military Construction was very aggressive about this. He was a tough one to deal with. Among other things, he was up in the committees in Congress trying to get them to put into the military construction bill language that would force more work in the direction of the Air Force. He used the S&A rate argument to persuade some of the staff members up there that this should be in. But the Corps did get its S&A rate down, and we basically won that contest.

Q: You said you wore three hats, and I've counted two.

A: The other one had to do with the post engineer program, or facilities engineering program.

In those days, facilities engineering was part of Military Construction. There was an operation over in the Pentagon where all this was being coordinated. I was a member of all of this. The part of Military Construction that dealt with facilities engineering was pretty much my responsibility.

Q: Now you stayed there quite a bit less than a year.

A: That's right. That's because of the Air Defense Evaluation Board, which was a study to decide whether or not to put the SAM-D [surface-to-air missile development] system into engineering development. SAM-D later became Patriot.

The hierarchy of these weapons systems is that first there was Hawk. Then there was improved Hawk.

Hawk is a continuous wave homing missile. You illuminate the target with a certain frequency of radiation, it reflects the radiation, and the Hawk missile homes on this. That's a pretty good system. But it is a system against which you can use certain types of electronic warfare countermeasures.

They were seeking a different technique. They also wanted to use a phased array radar for tracking, which could handle many more targets.

This had been under advanced development for some time. The issue was whether this program should go into engineering development, which would have been getting it ready for actual production. There was also the issue of whether it should have a nuclear capability or not.

The problem was that it was too costly. Even the optimistic estimates were too costly, and there were some pessimistic estimates that said it would cost a great deal more than that. They decided that they wanted to get somebody to study this who was not from the air-defense community because they felt that everybody in the air-defense community was biased. They selected me to do this.

Q: This was an independent effort on your part?

A: I left OCE and had an office in the Pentagon. I reported to the Assistant Chief of Staff for Force Development. I received a small staff of about a half-dozen people. There were some civilians on it that had been in air defense, and there were some military.

We set up a study effort that involved the Missile Command at Huntsville and the contractor for the system, Raytheon, which is located in Andover, Massachusetts.

Another participant in this study was the Army Air Defense Center at Fort Bliss [Texas]. We got the Air Force involved. We had Braddock, Dunn and MacDonald [BDM], a well-known military think tank, which had an air defense computer model called TACOS. That does stand for tactical air something-or-other [tactical air combat operations simulation], but it also has a Mexican-sounding name, consistent with the location of BDM's office in El Paso.

This was a model for an air attack against Western Europe. You could put different air defense weapons in this simulation to see how they did. You could fly red attacks against blue defenses. You could put up a defense where you assumed you used Hawk on the one hand. Or, you could put up a defense where you assumed you used SAM-D. Then you could simulate the same attack and see how much you reduced the enemy air forces.

Q: This was a straight ground-to-air missile. It wasn't part of the ICBM system that was being developed at the time.

A: It was a tactical air defense system, which is what Patriot is. They were claiming at the time that SAM-D, with its phased array radar, would have a capability to engage enemy tactical missiles. The requirement would be to put a nuclear warhead on SAM-D, which would be used to engage either enemy aircraft, but more importantly, enemy missiles.

With a nuclear warhead, you didn't have to have such an accurate engagement in order to kill the incoming missile. If you assumed the incoming missile was nuclear-capable, then you would launch a defensive missile, possibly with a nuclear warhead.

Also, this system had a surface-to-surface capability. All this was mixed in together. Sort of in the way of R&D, they had listed all of the conceivable things that you could get a missile like this to do, if you're going to pay millions and millions of dollars for it. This system was going to have the capability to do all of these different things. But it made it extremely expensive.

The conclusions of this study were that, if we bought this system and deployed it, it would be more cost-effective. If you wanted to defeat an enemy attack to the same degree, it would require buying many more improved Hawk systems than SAM-D systems. The cost of the additional I-Hawk systems would exceed the cost of developing and deploying the new SAM-D systems. You'd have to decide how effective you wanted to be. Per kill in the scenario we selected, SAM-D cost less.

Q: Now this was in 1970? And Nixon was President?

A: Most of 1970. Yes. That's right.

Q: And in fact, of course, he had been inaugurated in January of 1969, before you went to OCE.

A: That's correct.

Q: What did this mean to you in the Corps of Engineers? Did it mean anything—that change of administrations?

A: During that administration there was another effort to reorganize the government. I wasn't engaged in this directly. Nixon came out with a reorganization proposal. In OCE, particularly civil works, the top people were very much engaged in the debate within the administration about whether there would be a department of natural resources that would absorb much of the civil works mission.

Another impact on the Army was Vietnamization of the war, which caused the Army to contract. From the peak of 60 battalions of engineers, the level of engagement in Vietnam was reduced greatly. That really affected the Corps, which had had so much of its troop strength deployed there.

Of course, the tailing off of NASA construction was part of the scene. They'd had their decade of the '60s when they'd done their big thing. Add up the retrenchment at NASA, the retrenchment in Vietnam, and the reorganization proposal as three things that I remember affecting the Corps.

Q: And they're all of a piece, in a way.

A: They're the same kind of thing. Republican administrations, until Reagan, tended to contract in the military sector.

North Central Division, 1970–1973

Q: That's right. Now we're getting to something I've been dying to ask you about because, you know, I'm having trouble myself coming to terms with their putting you in civil works at that stage in your career. I'd like to know why that happened.

A: General Clarke picked out the generals that he thought had some ability to put in charge of his divisions.

Every Chief, incidentally, comes to this. If you look at the number of divisions and you also look at the requirements that are filled frequently by engineer general officers throughout the Army, there are always more vacancies than there are engineer generals to fill them. The Chief of Engineers has to hunt around for people to fill all of the slots.

Of course, Clarke had observed me there when I was the deputy director of Military Construction. He knew that he had problems in the North Central Division [NCD]. I don't want to go into that in too much detail. I'm willing to characterize the problem, but I'd rather not talk about all the personalities involved.

Q: Okay, as you wish.

A: I'll say this. The North Central Division had not had a consistent administration. They'd had two division engineers that took short tours there and then went to Vietnam. They had been brigadier generals, and I think they felt they had to go to Vietnam to be selected for further promotion. Neither was selected.

Then they had had an interregnum of the Chicago District engineer being the division engineer. They had problems. The division didn't have a sense of direction, to be honest.

They had another problem: the workload was way off. Two things caused that. One, that part of the world is pretty well developed. You don't need to build a lot. The other thing was that without a sense of direction, the division planning effort wasn't bringing projects to the point where they could be authorized and built. The division was wandering. They were studying the daylights out of things, but they were never reaching a conclusion. Not that they should have been making up projects, but even the ones that were practical were not getting to the point where they could be built.

General Clarke probably thought I was a good one to send out to try to straighten this out.

Q: How did you feel about going out there?

A: Generally pleased. It wasn't my first choice of a place to go. But I didn't waste much time wishing that I could go to some other place.

Q: Now you're getting your first civil works assignment, and it is a post-NEPA world.

A: That was another factor in the North Central Division that I meant to mention. The environmental movement was more active up in that part of the world.

Q: Saint Paul District especially.

A: Yes, Minnesota, Wisconsin—Michigan, also. New York was still very much an industrially-oriented state. Ohio, as well, was leaning in the other direction, with the [Governor John J.] Gilligan administration. They were liberal. The Corps was probably under heavier attack in the North Central Division than in any other at that particular time. That was another problem that hadn't been dealt with effectively.

Q: Did you ever pause and compare that situation to the situation that your father had faced in civil works?

A: It was very different. When he was in it, it was an upbeat thing. The country was in an era of development, and the Corps benefited tremendously from the New Deal. The public works program of the Corps was part and parcel of the New Deal. We were under terrific attack in the 1970s. General Clarke exerted tremendous leadership to turn the Corps around to deal with this. That was easy for me to follow.

Q: What did he want you to do in Chicago? Was it the management of that division that he was concerned about?

A: I think in terms of his focus, coming to terms with the environmental requirements was the number one item. But right up there was getting the division more efficient. It certainly needed that. This was punctuated when they had their command inspection a few months after I arrived.

When I first went out there, I lived in the bachelor officers quarters at Fort Sheridan [Illinois]. I was assigned on the 15th of December, went out for a week, then came back for Christmas, then went back and lived in bachelor [quarters] until June because I had children in school in Arlington.

At the time, Nancy and I and the children had just moved into this house where we're talking. The very week that my wife arrived with the children at Fort Sheridan was the week of this command inspection. She had quite a time because at the conclusion of it we had a get-together for everybody in our house. We did have the benefit of an enlisted aide to help her put this together.

At the conclusion of the command inspection, [Major General Francis P.] Frank Koisch, the Director of Civil Works, in his exit interview, said there were a lot of problems. Then he went back to OCE and wrote a report that it was the worst division in the Corps of Engineers.

Q: Did he kind of surprise you with that?

A: No. I knew there were problems. I also knew that the inspection had not gone well. Some of the district engineers had gotten things together; but at least one did a very poor job in terms of setting up the part of the inspection that was in his district.

The practice in those inspections was to send people to each district. The leader of the team, and maybe a couple of the top people, would go to each district and visit for a day.

I think possibly we skipped one of the districts—and it was probably Buffalo—because the North Central Division had five districts. In only a week, it wasn't practical to visit five districts. I think we went to Detroit, Saint Paul, Rock Island, and then Chicago. We did not go to Buffalo.

I knew it was in trouble. I don't believe there was a particular reflection on me since I had been there nominally six months, but actually in the job less than six months. I didn't take it as a criticism of myself. I realized there was a lot of work that needed to be done.

There were some fortunate coincidences. One blessing was that I was able, during the time that I was there, to select new top civilians for most of the positions in the division office.

In one case, the chief of engineering had died, and there was an interim man. I was able to select [Lewis H.] Lew Blakey to come there as my chief of engineering, which was an extremely fortunate choice. There was a series of these. Larry Beaudin was very good as chief of construction operations. But he retired, and I selected Carl Cable to come out from Philadelphia. If you're blessed with the ability to make these choices, that allows you to pick somebody that's really capable.

I'm afraid I've always been pretty cold-blooded about that. When you're selecting people for positions, I tend to bring in somebody good from outside, if he's better than the people who are there. I don't feel too much obligation to promote somebody in place. You have to be loyal to the people that are working for you. But when you're picking the top positions, you have to pick the best men you can find. That's what I did.

Also, some of the district engineers did better than others. Of course, they were turning over all the time. To an extent, I was blessed with getting new ones because when a new man comes in, he's willing to make a bunch of changes. If you have a guy who's been in a tour for two years already when you come in new, he's much less inclined to want in his third year to redo everything. If he's not doing as good a job as he might, possibly because his bosses haven't set a high standard, it's hard towards the end of his tour to get him to change.

I definitely went to work on the problem of making plans as to what we were going to do with our money. I was confronted with that right off the bat because I started work out there the first week in January. I had to come in and testify before the committees of Congress on the program.

My recollection is that occurred in March. I had very little time to get ready for that. I came in and was put through the wringer before the committee of [Representative Joseph L.] Joe Evins, which was the public works subcommittee of the House Committee on Appropriations.

I did reasonably well in terms of knowing my program. But I got a lot of questions about what we had done with the money they had given us the preceding year. The truth was, we hadn't done much. In construction, they'd built the things. But in areas like planning and design, they'd spent the money, but there was very little to show for it.

So I instituted a series of reviews with my district engineers. We set up what they were going to do. I believe the first series was semiannual. I guess the first one was just where they stood and said what they were going to do. They had to have plans and schedules.

The second one was how they'd done. The second one was bloody because they announced all these plans, but then when they came in, they hadn't done anything. So they got the word that that wasn't acceptable.

Then the third one, things began to get better because they knew that if they came in not having done something, they were going to get wiped out. They began to get the

idea that these plans had some meaning. If they said they were going to do this, that was expected.

This whole process of making up your mind what you're going to do and then doing it was new to many of them. Let's put it this way. They hadn't been doing that recently. The division did turn around. There's no question about it.

Q: So you approached the problem of turning it around from the top, through the district engineers.

A: Absolutely. There were a lot of details. But as far as I was concerned, we had a job to do. We had to plan. The planning function involves studies.

[Lieutenant General John W.] Jack Morris replaced Frank Koisch as Director of Civil Works. He came from being the Missouri River division engineer. He very much wanted to improve the planning function and reduce the number of studies, put enough money into the studies to get them finished, get reports out—the whole business of having milestones.

Frank Koisch hadn't had this attitude. He had had the attitude that in many cases the members of Congress really didn't care whether these studies were really ever finished or not. They just wanted to be able to tell their constituents that this and that problem in the river and harbor area was being studied, and that was enough.

Morris and I had a different view. We ought to study it. We ought to decide whether there should be a project or not, get it finished, get it out of the district, get it out of the division, get it to the Board of Engineers for Rivers and Harbors, have them act on it, and get it up to the Chief and get it over to Congress, whether the report was favorable or unfavorable, and then go on to another one—rather than having some of these things that had been under study for ten years.

You may have heard about the length of time it takes to get a project authorized and built in the Corps. We felt that was a bad situation. It was much too long.

Q: You were a soldier and you came into the civil works job in the new environmental context and you dealt with it. But your employees were not soldiers.

A: There were complaints about the fact that the environmental movement was using unfair tactics. But once they saw that we were going to try to be responsive to the environment, I think there was a willingness to do it. It had a big impact on the study program because you had to integrate the Corps' study effort with the environmental impact statement. It was a struggle to build this interface.

We did a lot of work in revising the study program in terms of the public hearings we were going to have, at what stage you did what things, the way in which the Corps would develop its plan and build the environmental impact statement—so that as you came down to the conclusion of one of these studies, you had met all the requirements of the National Environmental Policy Act at the same time that you had the Corps study done.

There were some tricky things because of the way these two interacted. But I felt we had a pretty good situation. What happened in some cases, but not all, was that projects that had had a lot of support from the community lost that support due to the efforts of the environmental advocates.

Whether the projects were good or bad is a difficult judgment to make because it depends on what your goals are for a particular area. Typically, a member of Congress and the businessmen and perhaps a lot of the private property owners wanted the flood protection, and the landholders in the reservoir area weren't a vocal opposition. Some might have been, but some were probably willing to be bought out. The land wasn't that promising, anyway.

With the environmental movement active, a lot of this was turned around. Then you might have a different member of Congress. You might have had a Republican for years. Then you got a Democrat, and so forth.

Some of the studies that had been supported fell apart. The object was to get that decided. If there was no support, then you could send in a negative report and get it off the books. Our goal was to have no more than six studies per district. There had been two to three times that number in some cases.

Q: Just because they had sat there too long?

A: Yes. They were just kicking around. They were getting low levels of funding and they were on the books. If you looked at the size of the districts, the time of the district engineer, the fact that he had to hold public hearings and so forth, a district couldn't handle more than six. You couldn't do all the things that had to be done.

Q: You were chairman of the Upper Mississippi Basin Coordinating Committee while you were out there.

A: That's right. There was an evolution going on in planning. There was a commission for the Upper Mississippi River Basin, and there was a commission for the Great Lakes Basin, as well. The Corps had always tried to have these interagency liaison activities.

While I was there, the Great Lakes Basin Commission, in particular, became very active. They were trying to complete a basin plan.

Fred Rouse was the head of this basin commission. He was a Republican who had been put forward by Governor [William G.] Milliken of Michigan and had been appointed. George Greibenow was the chairman of the Upper Mississippi River Basin Commission.

The Corps was by far the best organized of the federal agencies to address the kind of problems that these basin commissions were addressing. The basin commissions consisted of representatives from the states, plus representatives of the federal agencies.

There was a mixed attitude towards these. Some division engineers felt that these basin commissions were a total waste of time. It is perfectly true that much of the planning they did didn't get converted into work. Other division engineers—I'd put myself in the latter category—felt that the way the government was evolving, the Corps had to have strong working relations with all these other agencies.

EPA [Environmental Protection Agency] had an important role, the Fish and Wildlife Service, and so forth. The basin commissions were a good way to interact with these people.

You didn't solve the problems on a particular project in these basin commissions. But you had a framework in which the role of each of these agencies was evident. At these meetings, you could interact with these people and then talk over problems you had between you and agree to get together in the subsequent weeks to solve the specifics.

I felt they were a plus. I probably spent more time on all these interagency things while I was division engineer than I spent on the command of the division.

Q: So you really did think they were very important?

A: Yes. Another set of the activities that demanded a tremendous amount of my time came under the International Joint Commission [IJC] which was formed under the Boundary Waters Treaty of 1909 between Canada and the United States. I was the chairman of the American section of five different boards or committees under the IJC. There was one for the regulation of Lake Superior. There was one for a study of Great Lakes' levels. There was one for what to do about the American Falls at Niagara because they were crumbling down. There was one for the regulation of the water at the outfall of Lake Erie. And there was one for the regulation of the water at the outfall of Lake Ontario.

These things were meeting all the time. The one that was most operational was the one on Lake Superior. My Canadian counterpart, Bob Clark, and I basically were involved in the issue of how much water to let out of Lake Superior.

We had the highest levels the lake had ever achieved up to that time. They have since gone higher. But 1972 had the highest level of water that had ever been recorded. We had the typical upstream-downstream debate. People on Lake Superior wanted us to let more water out so that the water levels would not be so high. The people on Lake Michigan wanted us to hold it back because they didn't want Lake Michigan to be so high.

The high water was a problem because when the water got high—above the normal beach shore—it caused huge amounts of damage to the people who had built close to the water.

Q: Did you get involved in the Reserve Mining Company controversy over asbestos tailings?

A: That was fairly far along by the time I got there. I believe that was already at OCE.

Q: You had enough to do, I'm sure.

A: Yes. I remember talking to Fred Clarke about the case. But the district engineer had already made his recommendation and it had already gone up.

Q: You were a pretty vocal advocate of year-round navigation.

A: That was another program that was instigated by U.S. Steel and that came along. When I say "instigated by U.S. Steel," it was represented as being advocated by all of the lake carriers, but the truth of the matter is that the dominant carrier on the lakes was U.S. Steel. The other operators were a small factor. U.S. Steel wanted to be able to move ore the year-round. This was an economic thing.

When it was natural iron ore, it was impractical, because the water content prevented handling the ore in the wintertime because of freezing. But when they went to taconite, which was processed ore—all pelletized—since the pelletizing process dried it out completely, the material could be handled year-round.

They wanted to move the ore year-round so they could reduce the size of their fleet and the size of the storage. They wouldn't have to have the huge stockpiles that they otherwise would have to build up to be able to operate their blast furnaces through the winter.

There were two main bottlenecks to the movement of most of the ore. One was the Saint Mary's River at the outfall of Lake Superior. The other was at Detroit, the Saint Clair River. The first problem was to break the ice.

But that wasn't the greatest problem. The greatest problem was to control the consequences of breaking the ice. Under natural conditions if the ice was allowed to form, it would form a protective cover, and the river would flow normally under the ice.

If the ice was broken, you risked building up ice dams. Every time the ice was broken, it would refreeze. With repeated breaking there would be ice all the way from the surface right down to the bottom of the river, and this would dam the river. Then you'd have all kinds of flooding, interruption of flows, and related problems. This had all kinds of environmental consequences.

The problem was, could we come up with a way to keep the channel open that would allow navigation late into the winter? We tried this. There was one winter when the ships operated all winter. That was a mild winter.

This program raised an interesting issue on whether or not you finish a study. The program was funded as a study. The object, I thought, was to get a project authorized that would provide for the Corps to do certain things that were necessary to keep navigation open and would authorize some of the activities of the Coast Guard and so forth.

I pushed that along. We had to have an environmental impact statement as well as a study report. I kept pushing. When I was getting ready to leave in December of '73, I felt that it was within six months of being done. In fact, I tried to get it done before I left, but there were some delays.

Well, they never finished it. The reason they never did affords an interesting insight on the way these things work. I think a judgment was made that they never really could get this project authorized. They could have had a report. They could have sent it to Washington. They could have sent it to Congress. But there were definitely different sets of people.

The power companies didn't like this because disruption of the flow of the water interfered with the generation of power. The environmentalists didn't like it because there was a lot of damage from the ice. The conclusion was that if they could think of reasons to go on studying it, they could think of reasons to go on passing ships, because the experimental work to pass the ships was allowing them to do what they wanted to do.

They were going to have a perpetual study which would be doing the same things that the project would do. They would be allowed to do these things without an authorized project. If you said, "All right, the study is finished, now we want it to be authorized," they wouldn't ever get it authorized, and then they wouldn't be able to do it anymore. That may seem somewhat involved, but this is an example of American politics at work.

Q: It sure is.

A: There's a lot of this going on in our government. The perpetual study allowed winter navigation, whereas if you finished the study and tried to get an authorized project for winter navigation, you never would have gotten it, and they wouldn't have been able to move the ships anymore. I'm not sure what the situation is now. But that was the situation for many years.

The other phenomenon which I've run into many times in my career is that in the early stages of something, you can really make progress. But if it has inherent problems, as time goes on, it crawls to a halt. The nuclear excavation of the sea-level canal was like this. When we were in the early stages of planning for this, everything moved along smoothly. As we got deeper into it and got to understanding it more, we ran into a lot of problems we weren't able to solve, and the thing finally ground to a halt.

The winter navigation was somewhat that way. At the early stages, everything was going along pretty well. But then, we ran into the shore damage. We ran into the troubles with the power companies. The problems of the program tended to bog it down.

Trying to write the environmental impact statement for the winter navigation was a real problem. When you start talking about the environmental impact of this ice breaking, we had incredible difficulty trying to estimate just how much damage was due to the winter navigation and how much would have occurred anyway.

We had the people from the Corps up at the Cold Regions Research and Engineering Laboratory working on this problem, trying to help us make estimates of what would happen to the ice. But it was very difficult. In spite of the fact that they had a lot of knowledge, you couldn't model this ice-breaking, for example. Without a model it was hard to estimate how much ice would be generated and how much shore damage would result.

Then you got into the possibility that there would have to be a compensation program. If you broke ice on the river, if there were people on the shore and their docks got carried away with the ice, then you'd have to pay them for the docks and so forth.

Q: And that would recur.

A: And that would recur. So how would you do this? So I think that's one reason it was never brought to fruition.

Q: You had your hands full up there.

A: There were a lot of things going on.

Q: The 12-foot channel was going on.

A: That's right. I tried to dismiss that and succeeded. We had a study on the navigation of the upper Mississippi River. We issued an interim report saying that the 12-foot channel was not justified.

That's an interesting example of the way these things work. There was one theory that it was a mistake to issue this report because the navigation interests would be upset if we did. The other side of it—and the reason I issued it—was that it was a phony issue and I wanted to put it to bed. It was pretty evident that it would never be economically justified. It wasn't all that important to the navigation interests. They knew it was never going to happen.

But it was a lightning rod. It was attracting all kinds of strikes from the environmentalists. They were using that to paint the Corps black. They still tried to, even after I issued the report. But that was an example of one of many things we did to try to come to terms with the environmental groups.

Q: What groups caused you the most trouble?

A: The Sierra Club was the most aggressive group. They may not have been at the national level. But they had a good organization, and they were everywhere, helping to organize the people that were opposed to these projects. They are the ones I remember that were most effective.

Q: How did you fare at the hands of the press in the region?

A: It was a mixed bag. We got good credit for some of the things we did. We got criticized. We got some good coverage, not so much in Chicago because not a lot was going on in Chicago. But in Detroit we got some good coverage.

We got some very good coverage because in Cleveland the work on the harbor was very important to the city. We got some good coverage out of the work that we did on

the study of the Cuyahoga River. We got press coverage on the land treatment sewage disposal studies before we ran into a buzz saw because the farm areas where we proposed these big disposal sites really didn't want this.

Q: Disposal of dredge material was a hot issue, wasn't it?

A: That was a hot issue. During the time I was there, we got a lot of positive press from that. There had been a major study of this disposal, and the diked disposal was authorized just as I came on board. The study had been going on for five years about methods of disposal of contaminated dredge spoil.

We also had Section 404—the environmental part of the Water Pollution Control Act. We had the authorization of the diked disposal. This all came together, but it was in the action mode during the time I was there. We had to get the local assurances because they were required to provide the land, easements, and rights-of-way for these diked disposal areas.

Some districts did better than others. Chicago did terribly on this. We never did, during the time I was there, get from Chicago a site for a major diked disposal area to take care of the upper reach of the Illinois waterway.

There are two branches to the Illinois waterway. One goes diagonally up through Chicago, which is the old Chicago River. The other one is a cutoff that runs south of the city, east-west, and goes into Lake Michigan down at the very south end—down near the south works of the U.S. Steel plant.

It was down there that we needed diked disposal areas to dispose of dredge spoil. U.S. Steel was one of the big companies that was to benefit from this. Because of the participation required of the local governments and private industry, we never did get agreement.

There was a waterways committee of the Chicago Board of Commerce and Industry, which was a municipal business group. We worked through them. They had Mayor [Richard M.] Daley working on trying to get people to agree on this. But they never came up with it. This was because the environmental groups were opposed to it.

You had to have a strong industry backing to put together the local equation for these things. If industry wasn't together on it, then you couldn't coalesce the elements to get agreement on one of these disposal areas.

Q: Did you have any important military work while you were out there, or was it pretty much civil works?

A: The only thing left was the Chicago District work on the Newport ammunition plant, which was one of the new explosive production lines. That was a big mess. It was a big mess because there had been multiple contracts. I guess it had started out as a cost-plus-fixed-fee contract. It had to be converted to fixed-price. Of course, you're not supposed to have the same contractor with both a fixed-price and a cost-plus-fixed-fee contract at the same time on the same job.

The job got way behind. There was tremendous anguish. [Major General Richard M.] Dick Wells took over as the district engineer when this was going on. He finally got it straightened out.

Q: In Chicago?

A: Chicago District. It had really been messed up. But Dick came in and saw—and I told him—that we had to get this straightened out. We couldn't get any welders. There was a lot of welding because it was a chemical plant, but they could not get enough qualified welders. The truth of the matter is, they had neither a schedule nor a cost estimate for this job.

Q: It's not like an ammunition plant is a mystery, is it?

A: This was at the early stage of a program that is still going on to modernize all of the ammunition production in the United States, because much of what they had dated as far back as World War I.

At the time they started this plant, not all aspects of the design were firm. They just started to get going. They did firm up the design, but then, of course, they were well into the contracts. So there was a mountain of change orders, many of which had been issued but never agreed upon. It was one of those cases where the scope of work was uncertain. The schedule was uncertain and the cost was uncertain. When you have such a job, progress is usually unsatisfactory.

Q: The same kind of issue came up with Israel, as you know. People were saying if you'd stopped and thought about the project a little longer, and taken the time at the front end to get an understanding of the work, it wouldn't have taken so much money and so much time later to actually execute the work. Does that sound familiar to you? Is that a legitimate complaint?

A: It is a legitimate complaint, but it comes about because people won't make decisions. It does take some time, but frequently you have this situation. You have the requirements person, the user. He wants certain things, but he's not completely clear

in his mind what it is he wants. Then you have the designer and builder. He doesn't always know exactly what it is he's going to do to respond to the requirement.

In the case of the Israeli airfields, certainly there was the issue about the shelters. The Israelis had a need for shelters. But they weren't sure exactly what the configuration would be, and they certainly didn't have a definitive list of what was going to be in the shelter. They knew they wanted hydrant refueling, but they didn't know precisely what delivery rates and so forth and so on.

Yes, if you take enough time. But often, even when time is provided, the people don't come to grips with these issues. You will say, "All right, we'll have a meeting next week, and you will bring to the meeting a complete list of your requirements."

You will go to the meeting, and they will not have a complete list of their requirements because of this, that, or the other thing. Then you will say, "All right, we will make a cost estimate of how much it costs to build this list, and you'll have a meeting next week." Well, you show up at the meeting next week.

Two things. One, the list of requirements is still incomplete. Two, the cost estimate is incomplete and full of errors. So you ask the engineers to go back and complete the cost estimate, and the requirements guys to go back and complete the list. Then you'll have a meeting the following week. Well, neither will have done exactly what he said he was going to do. The engineer will have a bunch of excuses about why he couldn't estimate the cost of this or that aspect. The user will still not have decided something about his requirements.

It takes real tenacity and firmness to get these planning drills done. It's true to say they didn't take enough time to decide it. But it's also true that they didn't work very efficiently with the time given.

Q: I see. And the same situation obtained with the Newport plant?

A: I'm sure from knowing the way these meetings go. "All right. We're going to negotiate this change order. Please come back next week with your costs." Well, the contractor will come back. He won't have seriously looked at it. He'll just grab a number that he knows is enough and he'll come back with that. Then you ask, "Where's the backup?" "Well, we didn't get around to that."

It's hard work to resolve these issues.

Q: Sooner or later, they have to come to grips with things.

A: They have to, but it takes a while. It's a very common situation that people will avoid work as long as they can. Then when it becomes impossible to avoid it any more, they get down to it.

Q: I'm afraid it's true. Is there anything else we should discuss about your tenure in with North Central Division?

A: I don't think so. I just want to mention that one of the studies that I did manage to get finished was the study of the Great Lakes levels. This had been going on for ten years, and the chairmanship on the U.S. side most of this time was in OCE.

The civilian who was the chairman retired. With my urging and the cooperation of my West Point roommate, Ken Cooper, who was the deputy director of civil works at the time, the chairmanship was moved out to Chicago.

I took it over late in 1971, and we drove this to conclusion. I worked night and day. In fact, the final meeting of this board occurred after I had left the division to go to the Atomic Energy Commission. I went back to Chicago for this meeting. I got everybody to agree that I would remain the chairman until we got this finished.

The basic conclusion was, when it rains more, lake levels rise; when it rains less, lake levels fall. But we did make some specific recommendations about things to do on the Saint Lawrence River that would help discharge the water there.

Q: Night and day must have been the way the whole three years went because of all the work involved.

A: It was a very busy time. I was young and I liked to work hard. I really loved it. I had hoped to be able to stay on until the summer. But this Atomic Energy Commission job came up, and I had to go to it.

Q: You mentioned that you saw your three-year tour at North Central Division as divided into three year-long stages.

A: The first year was very much a learning stage, perhaps because it was my first assignment enmeshed with so many aspects of civil works. But I did start some things in that first year. As I mentioned I had to select a number of new personnel. The second year was more devoted to putting into effect changes and getting the people in the division into a mode of operation that would produce results. By then I knew what I thought the division ought to do. A lot of changes had to be made, some that I started in the first year, others that I concluded had to be done. The third year was what I would call a production year. By then the organization was changed and functioning as

much as it ever would in accordance with the way I thought it should, and we were able to complete a number of things.

The division wasn't very active in construction. After all, in terms of water resource development, that part of the world is fairly mature. People have been on the Great Lakes since the French and English first came over. The channels have been dug and the locks have been built and so forth. But there were a number of studies ongoing about enhancements and extensions. These had been dragging on forever, because the division didn't have an ethic of finishing these studies.

Jack Morris was the Director of Civil Works at the time, and he and I were in total agreement that you should finish studies. In fact, that was the difference between Jack, on the one hand, and his predecessor, Frank Koisch, who tended to feel that the study effort was something that Congress preferred to see proceed at a low, inconclusive level.

Jack and I felt that we should concentrate on fewer studies and get them done. That's what we tried to do. We had a rule of thumb that no district should have more than six studies at any one time. This had to do with how many public hearings the district engineer could handle, the size of the planning staff, and what you might call management span. If you had more than six studies, you couldn't keep track of them. You couldn't press ahead with them.

For the North Central Division with five districts, that would have made 30 studies for the division. That was more than enough in terms of our involvement from the division level. In the third year, it got to the point that I really did know what the 30 studies were that we were supposed to be pushing. I could call the district engineers to account.

I may have mentioned earlier the notion that I developed from my first experience when I came to the division. I had to go up to Congress to testify on what we had done with the money it had appropriated the year before. I got a lot of questions, and I realized that the division had not done that much with the money it had in the year preceding my arrival.

I determined that the next time I went back up there I was going to give an accounting of what we had done with the money. The construction was fairly straightforward. Even in maintenance it was not too difficult. But in the study program, it was extraordinarily difficult, because if you never finished any studies, what progress could you reflect?

That's the way I started the set of milestone meetings with my district engineers. This illustrates the notion—in the first year I was learning what was going on and the second

year I was finding out it was very little, and telling them that the next year had better be better.

This series of meetings the second year was somewhat brutal. I think most of them decided they didn't want to go through that another time, so when the third year came along, there was real progress.

Q: But you waited until the second year before you really put the squeeze on them.

A: I really didn't have a basis for doing it in the first year. We went over where they stood. There really wasn't any basis for scrutinizing them on what they had done in the preceding year because there was no schedule or goals. If there were, they were very ethereal.

But then, in the first set of meetings, we agreed on where they would go for the next year. That was part of the examination. Where are you and what are your plans? They would come up with a milestone schedule for each study, the progress in preparing the report, the hearings that would be held, and so forth. When we got together the second year, the question was whether they had done those things. To a large extent they had not. Some had, but some hadn't taken it too seriously.

When you projected that you were going to complete a study in three years, if you let a third of the study time go by without accomplishing much, there was an issue of whether there was going to be enough money.

The last thing I wanted to do was to go back to Congress and say, having told them we could complete this study for \$100,000, that we now needed more money because we hadn't finished it. To me that was totally unacceptable, because we would go in every year saying what it was going to cost to complete these things.

We had to ask for a lot more money the first year I went to Congress, and the second year we had to ask for some, but I was bound and determined that I wasn't going to ask for a penny more the third year. There was no excuse for that. I got over to my district engineers that that was what I expected. I think they, and their staffs, couldn't believe it at first, but then they got the word.

Q: In your first year there, the year that you are doing a lot of your learning—of course, you do a lot of learning by listening. But how do you decide whom to listen to?

A: That's an interesting question. I listened to everybody. I listened to the Corps of Engineers itself, but, of course, there were a lot of outsiders that were interested. The members of Congress had a certain view of the way things were. The local authorities.

The governors. We had the governors of 12 states, and I went to call on most of them. I went to call on all the ones that showed any interest in seeing me.

Q: Were there some who didn't?

A: Yes, there were some scheduling problems. I had one of the most fascinating meetings with Governor Daniel Walker of Illinois. Bill Starnes, who was the division engineer of the Ohio River Division, and I made a joint appointment with Walker because, of course, the state of Illinois is divided on a watershed basis between the two divisions.

The day we went down to Springfield, Walker had a young man who was an Eagle Scout who was supposed to be governor for the day. We started this meeting with Walker, and Walker pretty well turned the meeting over to this Eagle Scout who asked us about the environment. Then we had the press in. So we got the distinct notion that Walker was not very concerned about the substance of the Corps' program, since he had turned this meeting with Starnes and me into a public relations gimmick.

Other meetings with governors were more substantive. Some were definitely interested. But the Walker administration wasn't particularly concerned about water resource development in Illinois.

Q: Apparently not. You mentioned that by the third year you had established your credibility there within the Corps, within the division, and without. Were there any groups with which you had trouble establishing your credibility, that was harder than with others?

A: I don't believe there were. Our efforts were more at cross purposes with some groups than with others. We got along pretty well with the Environmental Protection Agency, which was relatively new at that time and had an extraordinarily difficult mission.

We didn't really have credibility problems with them. We had differences of view about who fitted in where. There was a power struggle going on between the Corps and EPA with respect to the waste disposal business because the laws governing water pollution written at the turn of the century had put the Corps in the controlling position. When the revisions came along, the EPA was displacing the Corps, and there was a little tension there as to who had the say.

For example, Section 404 of the Water Pollution Control Act gave dredge and fill permits to the Corps. But by the time it all got sorted out, the regulations gave EPA a veto power on permits in this area. So those things had to be worked out.

We had had a long history of relations with the Fish and Wildlife Service of the Department of Interior. I don't think there was a lot of mutual rapport there, although the Interior Department people and I got along pretty well. But there were a lot of differences between us.

Some of the state administrations were more friendly to the Corps than others. My recollection is that there was a basic antipathy with the administration in Minnesota. We had a terrible time with the state of Minnesota over dredging on the Mississippi.

Another place where we had a problem, but really did well in terms of credibility, was with Governor [Patrick] Lucey of Wisconsin, over projects in his state. He wrote General Clarke a letter challenging the projects. [Major General Charles I.] Chuck McGinnis and I went to see him. We conducted a short restudy and in the end he supported us. He told me in a subsequent meeting of the Great Lakes Basin Commission that he had really been impressed with the Corps' responsiveness and integrity.

No, I don't think we had real credibility problems. That doesn't mean the programs fared well. But we got respect for integrity and competence.

Q: Did you comprehend your three-year assignment there in stages like that at the time?

A: Yes and no. I may have mentioned that I always believed there was a learning period at the beginning. Perhaps I am more cautious than some, but I always wanted to get the lay of the land before doing things, unless there was such a serious situation that it required immediate correction.

Typically, I wasn't one for making a lot of changes until I was sure what would be most constructive. There was always a period in my assignments when I was trying to get across an ethic and a mode of operation. In any organization, it takes time for the people to adapt to new leadership—to be able to read the boss.

But I didn't have a formal concept of phases. I didn't say, "There are going to be three phases to my tour." Those things just come about naturally.

Q: How would you characterize the ethic that you tried to communicate at that time?

A: It would be two-fold. If you are a government servant, you have to give the taxpayers something for their money. Therefore, you should be product oriented. What results are you going to achieve? Second, for the most part you have to make a plan of what to do. I am not picky about plans. Any kind of plan will do, although it needs to be thought through.

You have to really work on fulfilling that plan. But to give you a notion of what I mean, people would come in with cost estimates of what it would take to do something. My attitude was, never to cut that estimate unless it was outlandish, because I knew that it was going to cost more than that estimate. It almost always does.

If a guy comes in with an estimate and you don't cut him, and then he can't make it, you have him. You say, "Look, I asked you for an estimate. You came in. I didn't cut your estimate, and now you are asking for more money." That was my attitude. Let them make their own plan. Don't interfere with them. Tell them it is their job. Make their plan, make their estimate. Make sure they have thought it through. Then, approve it and crucify them if they don't fulfill it.

That is the ethic that I felt toward my bosses. I wanted the freedom to make my own plans, to submit them, to get them approved, to be left alone, and to have it be entirely my fault if we didn't deliver.

Perhaps this was narrow minded, but since that is the way I like to operate, it seemed to me that's the way my subordinates should operate. This is the notion of devolving authority down to the people below you, then holding them responsible for getting the job done.

Q: How did they respond to that?

A: Generally, it takes a while for them to get that idea. They have been over supervised so much that they don't immediately grasp the notion that you are trying to give them the ball. This isn't universally true, but there is a habit of not wanting really to take responsibility. They complain all the time about over supervision, but psychologically it is nice, because if the boss keeps telling you what to do, then if something goes wrong, it is his fault.

If you have an ethic where the boss says, "All right. What are you going to do?" and then you have to decide, that makes you responsible. I think people, once they come to that, realize it is much better. But they haven't had the habit of making up their minds what to do. Therefore, they don't immediately take to this.

Q: This is the boss in you talking, of course. This is the commander and the manager.

A: Yes.

Q: Did the engineer in you ever want to say, "Let me do this?" Did you have to resist that?

A: No, except that I have to admit, when it came to the technical details of these things, I did examine and question things. If they were proposing something and it seemed questionable to me, I didn't hesitate to ask questions.

There were technical issues. I remember we had problems with stream enhancement near the Ford River Rouge plant in Detroit. We were putting in a floodway and were having trouble with the concrete. The design called for digging a V-shaped ditch, then pouring a concrete liner. In one of my visits to the project, we had quite a technical discussion about overcoming problems with the concrete liner.

I never hesitated to review the technical aspects—I felt that was different. I was speaking earlier about management. I didn't want to interfere with what people they used or how many people they used—things like that. I wanted them to handle the scheduling.

Occasionally, when the district engineer or the project engineer would put up a schedule, it would be incomplete, or the arithmetic wouldn't be right. That would call for a question, such as "What's the cost of this study?" They'd give a figure. Then you'd say, "What is your assumed number of man-years?"

Then it would be evident that they were planning to spend a lot more money than they had people. This led into an issue that recurred frequently when I was Director of Civil Works. This was the problem of whether there was a logical mesh between the number of people available and the amount of money to spend.

The districts tended to keep more people around than they could pay for. It was a natural tendency not to want to let people off, even if the workload in dollar terms was dropping.

When I was in the North Central Division, we started a rigorous analysis. If a district had a certain size program, how many man-years of government effort did that involve? And if that was the number of man-years, what was the strength going to be?

In the Corps there had been all kinds of problems over manpower—the numbers of people—constant fighting. Very often we were subject to reductions of manpower by the Office of Management and Budget. After all, the Corps had had a huge force account during the 1930s, when a lot of this work was done by the government rather than by contract. The Corps has been going down in strength for years. There was a lot of argument about the proper way to decide who would get people and who wouldn't. If there was to be a cut, who would lose?

My idea, which took more effort, was to say, "How much money have you got?" If you have a certain amount of money, how many salaries will this pay? That will determine your manpower. If there isn't enough manpower to spend the money, then what percentage of the effort will you contract? We had a lot of argument about that in the study program, because there was more money than there were people. So we had to work out the percentage of the effort that would be contracted.

The districts in the North Central Division had never made this type of plan. They would just start paying salaries at the beginning of the year, and then at the end of the year, the money wouldn't be spent. When you went back to Congress with these huge carryovers, Congress would be very upset. Why, if we have appropriated all this money, do you still have so much left at the end of the year?

Well, it was very simple. They hadn't made a plan to spend the money. So we spent a lot of time on this, not so much my telling them how many men to use, but my insisting that they make plans.

If you talked to my district engineers, they would probably tell you that, unlike my description of giving them the ball, I was forever telling them what to do. True in this sense: I was forever trying to teach them how to manage their affairs. But I didn't get into many of the substantive choices. When I became the Director of Civil Works, I tried to do the same thing Corpwide. For two years, I visited every division and made the division engineers tell me how they were going to spend their money.

My concept was that if they made plans, they would spend it, and they would get the work done. If they did not make plans, they would not spend the money, and they would not get the work done. I think that panned out. However, it was hard work. The allocation of personnel had not been based on such rigorous analysis before. It was hard to generate and sustain interest in doing it this way. We weren't using computers the way we do now. The spreadsheets were prepared with calculators and typewriters.

Q: You don't usually have a three-year assignment.

A: Only twice: as North Central division engineer and finally as Director of the Defense Security Assistance Agency.

Q: And so you really don't always, or most of the time, have the luxury of a long learning period, do you?

A: What has happened in my case is that I never got that third year of production. I had the first year of learning, and I had the second year of bringing about changes. But I

never really got that third productive year—or seldom got that third productive year when I wasn't fighting to get things organized.

Q: But there at NCD you had it.

A: But there in NCD I did.

Q: And you didn't have it the next place, either. I can tell that, because that's even less than two years. But before we go to that, is there something else I ought to ask you about NCD?

A: I think we have covered it pretty well. That was probably one of the best assignments I ever had in terms of being on my own to do what I could.

Q: And having enough time to do it?

A: And having enough time to do it. A felicitous assignment in every way.

The Atomic Energy Commission, 1973–1975

Q: I'm in sort of trouble with your next assignment, as Director of Military Application at the AEC, or I guess it was Energy Research and Development Administration?

A: It changed during the time I was there. Let me tell you a little about that assignment, so you can understand what was involved.

When the decision was made to devolve the nuclear program away from the Department of Defense into a civilian agency, there was a negotiation among all the parties—the President and Congress and so forth—as to what the form of this would be. One of the conditions that was requested—perhaps demanded—by the military was that there be a military man in charge of the weapons program. That happened. The first man was an officer named [Major General James] McCormack [Jr.], who had been in the Army Air Corps, and was in the Air Force. Ken Fields succeeded him. Dodd Starbird succeeded him. [Lieutenant General Austin Wortham] Cy Betts, and so forth. My immediate predecessor was General Frank Camm, West Point out of the class of January 1943.

Most of these people had been engineers. There had been two from the Air Force, but the rest had been engineers, because it was a job that involved a lot of technical matters.

The man was the program director in the Atomic Energy Commission for weapons development, testing, and production. Earlier on, he had had even broader responsibilities, but that was the heart of the job. The development work was handled by two nuclear laboratories: the Los Alamos Scientific Laboratory at Los Alamos, New Mexico, and the Lawrence Radiation Laboratory at Livermore, California. These were supported by laboratories of the Sandia Corporation, one in Albuquerque and one in Livermore. I had been assigned to both nuclear laboratories as a junior officer.

The testing was done in Nevada, underground by the time I became Director of Military Application. The production was done in a network of plants over the United States. The final weapons assembly was done at Pantex, in Texas, near Amarillo.

The components came from several locations. Bendix in Kansas City was a supplier. The plutonium work was done at Rocky Flats, near Denver, Colorado. All this work was done by contract. The two nuclear laboratories were operated under contracts with the University of California. The Nevada test site involved two contracts. Reynolds was the contractor for operating the test site. Holmes and Narver was the contractor for the architect/engineer work. Dow Chemical was running the plant in Rocky Flats, near Denver, but Rockwell took over from them, and so forth.

The job of the Director of Military Application was to put the program together, to defend it before Congress, and then to oversee the execution of these contracts. Nuclear weapons are developed in response to requirements from the Department of Defense. DOD would send over a formal requirement through the military liaison committee. Then the development of the weapon would be assigned to one of the laboratories. Then we had to worry about whether it was in accordance with everything.

I came to that job with a lot of background. Frank Camm was the first one of the chain who had really come up through the system. [Major General Edward B.] Ed Giller, the Air Force officer who preceded him, had had some experience. But Camm and I started in the weapons program as junior officers. General Groves had brought me as a captain and Camm as a junior major to put these things together.

We were the first ones to become Director of Military Application who started out there at the bottom assembling these weapon—at the hands-on level. Our predecessors had been involved, but in supervisory positions.

We knew the guts of this stuff. I knew a great many people at the laboratories. It was a fascinating job. When less than two years later the issue came up of whether I should go back to the Corps, it was a difficult decision for me. Gribble wanted me to come back to be the Director of Civil Works in the Corps. I had to decide. I really did know the nuclear business, and it was a fascinating program. I had to decide between staying

there as the Director of Military Application and going back to civil works. I could easily have stayed four years in the military application job. Giller, one of my predecessors, had stayed five.

Q: You were happy doing that?

A: Yes. But, I had to think about what that meant for the future. I concluded—I don't know whether this was right or not—that if I stayed on there, it would be the end of my career in the Army. There wouldn't be any place else for me to go, I would retire from that job, and I would probably end up working in some nuclear activity.

That was one choice. The other choice was to go back to the Corps of Engineers and become involved in the civil works program. I decided I would rather go back.

During the time I was at the Atomic Energy Commission, the commission came to an end. That's a long, involved story that I am not sure I fully understand to this day. Dixie Lee Ray was the chairman, and there were several forces at work. One had to do with broadening the activities into other energy areas. Another had to do with separating the regulation of nuclear activities from the development. The commission was responsible for both development and regulation.

In the end, Congress passed a bill that abolished the Atomic Energy Commission, created the Energy Research and Development Administration, and created the Nuclear Regulatory Commission.

I was there for this transition. The first administrator of the Energy Research and Development Administration was [Robert C.] Bob Seamans [Jr.], who had been Secretary of the Air Force. There were assistant administrators for various areas, including one for defense programs. General Dodd Starbird, who had retired from the Army, became the assistant administrator for defense programs. He was my boss.

Q: Not the first time.

A: It was the first time I had worked directly for him. He had been instrumental in getting me into the canal business. But I had been out in Livermore, not working directly for him. I knew him very well. We were in SHAPE at the same time, but I had not worked directly for him.

Working for Dodd Starbird was a mixed blessing. He was a very bright, a very patient person. Easy to work for in that he didn't get upset. He was always very even. But he was a very detailed supervisor. He didn't give you very much freedom. He was very polite about all this, but you spent a great deal of time just tending to what Starbird

wanted to do. Since he had been, for five years, in the very job that I was in, he spent a lot of time doing my job for me.

I think perhaps this was the deciding factor in my decision to go back to the Corps. My choice was between going back to a job where I would be much more my own boss or staying on and being Starbird's principal assistant in this nuclear business.

As fond as I was of him personally, and as supportive as he had been of me throughout my military career, I didn't get the kind of professional satisfaction out of working under his close supervision that I had when I was more on my own. After all, I was 51 years old at that point. I wanted to be more my own boss than the situation in ERDA allowed.

I went through this transition with him from the Atomic Energy Commission to the Energy Research and Development Administration. I learned a lot from that and I contributed a lot. He relied heavily on me. I don't want to imply that he didn't give me a lot of opportunity. I made some very extensive presentations on the military program to help establish its position in this new agency. He relied on me for this.

Whenever anything came along, he wanted me there to do it. But he gave me a lot of guidance along the way.

Q: A little too much?

A: Well, it was a strain. During this period there was a nuclear incident at the Browns Ferry power plant, that belonged to the Tennessee Valley Authority. It consisted of three boiling water reactors. One was finished, one was fairly far along, and one was just beginning. There was a separate containment vessel for each. The one reactor that was finished was operating at high power.

The electricians were working on some cable connections. Where these cables passed through the reactor containment vessel, they had to be sealed. This is hard to believe, but the workmen down there testing for any leaks in the seals were using a candle. The sealant was flammable, and it caught fire. This fire damaged the control cables to the reactor.

There was a period when the control room didn't know what the condition of the reactor was. Most of these reactors, the boiling water reactors and the pressurized water reactors, have a negative temperature coefficient. This means that, as the temperature goes up, the changes in the reactor tend to reduce the rate of the nuclear reaction. This is one reason I think most of the scares about nuclear power are exaggerated. Generally speaking, as conditions become more dangerous, or potentially

dangerous, the physics is such that the reaction slows down. Of course, this is not always true, and loss of coolant can have serious consequences. At Browns Ferry they didn't really have any serious problems. But they did vent some radioactivity, and, of course, they were trying to sort this out.

Up at headquarters the people that handled the emergency reporting botched it completely. The people on duty did a very poor job. Top management got me into the act. I have forgotten exactly how this came about, but Starbird, I think, got me involved. The first thing I observed was that they had a committee that was trying to run emergency responses. I said that wasn't it. We had to have a single individual reporting directly to the administrator who was responsible for action. If management wanted the advice of other people, they could get all the advice they wanted. But they had to have a chain of command that went through individuals, and those individuals had to be responsible for decisions.

They had had this emergency action coordinating committee—the EACC. I changed that to the emergency action director.

Q: A difference.

A: I wrote a memorandum and Bob Seamans signed it, putting me in charge of all emergency action in the Energy Research and Development Administration.

The reason they chose me over other program directors was, I guess, primarily because the emergencies that most concerned them were any involving nuclear weapons. I recommended, and they agreed, that the Director of Military Application had to be the man in charge if there was any emergency—fire or the like—that would affect nuclear weapons. I had then to try to get all the emergency apparatus organized, and I spent a lot of time on it.

An amusing incident occurred not long after all this had been promulgated. I got a call from the White House. President [Gerald R.] Ford wanted to hold a meeting on Saturday morning to discuss the administration's position on a bill affecting private involvement in the production of nuclear material. The issue was whether Oak Ridge and the other production plants would go on being run as government entities, or whether they would try to devolve some of this to private enterprise. Another issue that was bound in with this was whether they would have private or government development of waste disposal. The basic issue was whether you would have private investment for this type of thing, or government.

However, Bob Seamans was on a sailboat, taking it from a harbor near Annapolis [Maryland] up to New England. He was out in the middle of Chesapeake Bay.

The problem was how to get Bob Seamans back to the White House for this meeting. From my experience on the Great Lakes, I knew about the people involved in this, so I telephoned Coast Guard headquarters, reached their emergency action lieutenant commander, and told him what the problem was. We also called Andrews Air Force Base [Maryland] to see if they could send a helicopter to get him, Bob Seamans, if we located him. Also, we called Dover Air Force Base [Delaware] to get them to send a car. We did reach Seamans by radio telephone, finally.

The Coast Guard located him, and they sent a Coast Guard cutter to go alongside his boat. He had a radio phone on the boat, but for reasons that I don't recall, we couldn't get that working. So he had to use the radio telephone on the Coast Guard cutter. I talked to him and explained to him what was required.

He said, "All right." The transportation would meet him at the entrance to the Chesapeake and Delaware Canal, where he was headed, in the morning at five o'clock.

They sent the helicopter from Andrews and the driver from Dover. The helicopter couldn't land because of the fog. So Bob Seamans got in the sedan from Dover, which drove him to Washington. He got to the meeting on time—showed up in his sailing togs, to the amusement of President Ford and the others present. It didn't seem like much at the time. I was able to call on my experience to get all these people into gear. I got the first call at home around supper time, and I called all these people at night. I got a lot of cooperation from all of them.

Q: Quite an operation, really.

A: Yes. It is an amusing incident. Bob Seamans and Bob Fry, his deputy, were really impressed. They never forgot it. It demonstrated that, if we had to do something, we did it.

But all that was cut short by this offer to go to civil works. I enjoyed that job, but I went off on another path.

Q: How much of that job was diplomatic in nature?

A: We had a program with England that involved helping them develop the warheads for their Polaris missiles. Unfortunately, the timing of my tour was such that I never visited England. We would have home-and-home visits. Their people came to Washington and I remember we had them to supper. Nancy had a very nice dinner party for them.

I had a lot of contact with the British Embassy. They had a man here in their embassy, Jimmy Harrison, who handled this—all the arrangements for the support we provided

to their research and development, including a test which they conducted at the Nevada test site of one of their warheads. I was supposed to go to England, but with my tour cut short, I never made it.

That was the main diplomatic thing. We didn't have any cooperation with the French, because they were pursuing a program that we didn't entirely agree with. This may have changed since; I don't know.

The cooperation with the British was kept very quiet. I remember that they didn't want any announcement of their test, which was called Fallon. Later it all came out, but they didn't want any advance announcement. Testing was very controversial in England, and the government didn't want this to be the subject of debate in Parliament.

They wanted to do the tests. They wanted to have the weapons improved. But they didn't want to go through all the flack of a parliamentary debate over this, and they succeeded in avoiding it at the time. Then it did come out and they did have the debate. By then the test was done so it didn't matter.

Q: You know, recently the question of whether any nation can win a nuclear war has been a frequent topic of discussion.

A: My thinking on that has undergone a fundamental change. When I joined the nuclear program, I didn't view nuclear war as totally different from conventional war. I realized nuclear weapons were more destructive, but during my first ten years with the program I had the view that it was just another weapon, however much more powerful. Now I think that the number and destructiveness of these weapons has grown to the point where nuclear war would be catastrophic to civilization.

I don't think it would end life on earth. I don't think it would end the human race. But I think it would be every bit as traumatic as the Dark Ages civilization went through after the fall of Rome. Maybe that's not quite the right analogy, but that's the general idea. Compare the state of civilization at the height of Rome with the situation in the Middle Ages. You could very well have at least that serious a setback to civilization if you had nuclear war. I don't mean one or two weapons, but a real nuclear exchange.

Q: When did your assessment change? Can you pin it to a certain period?

A: I wasn't thinking about this issue much when I was the Director of Military Application. It was a management problem for me then. I didn't spend a lot of time on the issue of nuclear weapons employment—primarily development, testing, production, safety, and security.

I was very much involved with the negotiation of the Threshold Test Ban Treaty. After his election in 1972 and the Watergate disclosure, President [Richard M.] Nixon was working on things he could do with the Soviet Union—dramatic things to refocus American attention. The proposal came up to have a treaty which would limit the size of underground explosions.

Word of this came to us. My recollection is they were proposing a threshold of 50 kilotons as the largest test to be allowed. I got the laboratories to work looking at this, and we concluded that would be a real problem for us in terms of its impact on improving designs.

The argument in the nuclear program had always been along the following lines: if you were going to have weapons like intercontinental ballistic missiles, you should allow progress in nuclear weapons development, because the warhead was the payload. You would pay many times over in the rest of the system if you were not allowed to optimize the warhead.

For example, if the nuclear scientists were allowed to work on the design, they might halve the weight of the warhead for a particular yield. If you knew the type of target and the accuracy of the missile, you could decide on the yield needed to get the desired level of damage. If you let the designers proceed and test, they might be able to give you the desired yield for half the weight, and that would have tremendous implications in terms of the size of the missile and its expense.

The warhead tended to be the driving factor, and we didn't want this treaty to restrict the United States without any tangible benefit. As a result of our efforts, the threshold was set at 150 kilotons, raised by a factor of three over what originally had been proposed. I also saw the need for an accelerated test program of high-yield weapons that were above this threshold, since once the treaty went into effect, you weren't going to be allowed to do any more high-yield tests.

We insisted that we wanted 18 months to the effective date of the treaty, and we wanted to use that 18 months to complete some programs that required high-yield tests. We won approval and additional money to do this test program.

They had difficulty completing the program, but overall it was a success. I mention this to explain my focus. I wasn't worrying about how the weapons were going to be employed.

I left there and went over to OCE in 1975, and then I was involved in civil works. I really started to take a harder look at these strategic issues when I went to the Office of the Secretary of Defense in 1978. Then I got into political-military affairs. I was

talking every day with the top people in international security affairs. I started looking at these strategic issues much more. It didn't take long to realize that the dimensions of nuclear war had changed a lot from the time that I remembered back in the 1950s and 1960s.

Q: Were you surprised at all when you looked at it from that perspective?

A: Not really. It was a subject, paradoxically, that I really hadn't dwelled on. I had been so involved with the mechanics of it that I hadn't really thought about the overall implications. I have not changed my mind about nuclear power. I think we are making a great mistake to de-emphasize it. Articles are being written that the civilian uses of nuclear power were grossly mismanaged. I thought this was so at the time, but I did not foresee such dire consequences for the industry.

My conclusion now is that, even though nuclear war would be catastrophic, we still have to have a deterrent capability. All the proposals for disarming do no good, because the real test is whether or not our posture deters war. People more expert than I point out that the danger is not nuclear war; the danger is war. If you have no war, you are not going to have nuclear war. Once war starts, you have the risk that it will escalate.

Q: So in August of 1975 you chose to go back to the Corps of Engineers.

A: Yes. I had to go, but Dodd Starbird—God bless him—had been stalling this.

Q: He did not want you to go back.

A: No, he thought I was doing a good job, and he kept procrastinating. So I finally went in and told him that I wanted to go. I had been hoping that he would get the idea. I didn't find it easy to go in and tell him I would rather go back to OCE than to continue to work for him. I felt that wasn't considerate, and it wasn't good form.

Director of Civil Works, 1975–1977

But he was very nice about about it. When I went in to see him, he picked up the telephone and made an appointment with Seamans right then and there. We were out at Germantown, and he got in his car and drove downtown to where Seamans was working, to see him. Then I left fairly soon.

Q: I was going to ask you whether Jack Morris picked you as his successor, but you said Gribble was the one.

A: The Chief of Engineers was the one that decided. Dan Raymond had been the Deputy Chief, and he retired. Gribble had decided to move Morris up from Director of Civil Works, where he had been for over three years, to be deputy chief. But they had not settled on a successor, and Gribble decided on me to be the Director of Civil Works.

Actually, when I got there Morris had already moved up to the deputy chief's office, so Civil Works was being run half by Morris from his position as deputy chief and half by the Deputy Director of Civil Works, Ken McIntyre.

Q: You and General Morris still knew each other pretty well by that—

A: I knew him pretty well because he had taken over from Frank Koisch as Director of Civil Works while I was still the division engineer in Chicago. I had had a lot of contact with him then.

Q: Recently we have had some pretty activist Assistant Secretaries of the Army for Civil Works [ASACW] in the Reagan administration.

A: Yes.

Q: Would you discuss your relationship with Victor Veysey?

A: Vic Veysey was the first person to hold this job. He was a former member of Congress from southern California.

Vic Veysey was definitely a Republican. He had been defeated for reelection because his district had been gerrymandered. He was definitely pro-environment, and he wanted the Corps to be much more forthcoming in its relations with the environmental interests.

It was interesting. I think that if he had taken over that job when Fred Clarke was the Chief, it might have gone more smoothly, for this reason: Clarke did a lot about the environment. Bill Gribble was really more conservative than Fred Clarke. He didn't deny the environmental aspect, but he wasn't as much of an activist concerning environmental matters as Fred Clarke. Therefore, Vic Veysey and Bill Gribble didn't mesh well. Veysey wanted a lot of things done; Gribble really didn't think they should be done.

Morris tried to serve as an intermediary on this, but that didn't work too well, either.

So I came along. Veysey had nowhere else to turn but to me, and he managed to get me to do some of these things. Perhaps with the experience of Gribble and Morris before me, I may have been a little more successful in handling his demands.

I remember one area that he was really worked up about. Basically I was in his camp on this one—the Atchafalaya Basin.

The Corps had had for years a plan for channelizing the Atchafalaya River. We had planned to dredge the river deeper and wider on the theory that this would make it a better conduit and would cut down on siltation. The siltation from the overflow of the Atchafalaya River was choking the swampland. It is a magnificent bayou or swamp. A very large volume of water flows through the swamp.

Siltation was choking this off. It was killing all the wildlife in the swamp. The silt came from the Mississippi by way of the Old River control structure.

There was an endless controversy about this silt. The Corps position, going into this, was that if we enlarged the channel, the silt would go down the channel, and it wouldn't choke off the swamp.

Well, there was another theory which said that it would just aggravate the problem.

Frank Koisch, by this time, was the division engineer of the Lower Mississippi Valley Division [LMVD] and chairman of the Mississippi River Commission. He was very much in the camp of the people that wanted to channelize the Atchafalaya. However, there wasn't an environmental impact statement that really addressed the issue adequately.

On the one hand, Koisch wanted to charge ahead, get Congress to vote the money, and dig this channel. On the other hand, Veysey and a lot of the environmentalists said that we should never dig this. Their ploy was that we should do a better job on the environmental impact statement, hold public hearings, and a whole long string of things. I had the unenviable task of trying to make Koisch do what Veysey wanted.

Gribble and Morris, I think, thought that we should not charge ahead, but they could not get Frank Koisch to agree. We sent him instructions to do things about the environmental impact statement, but he didn't do them.

Q: He had been Director of Civil Works before?

A: Yes. Then he had gone to Europe as the Deputy Chief of Staff, Engineer, U.S. Army Europe. When he came home from that job, he become the division engineer of the Lower Mississippi Valley Division, which was often a senior position.

Bob MacDonnell had gone down there after his time in OCE as Director of Civil Works and Deputy Chief of Engineers. Bob Marshall took the job after he was deputy chief. It was not at all unusual to assign a senior major general to LMVD.

Tommy Sands, who is down there now, is not in that mode. But Bill Reed had been in senior jobs in Washington when he took over the division.

Q: Does that make it difficult, though, for the incumbent Director of Civil Works?

A: Not usually. But it made it difficult because Koisch wouldn't do what anybody told him to do. He wouldn't do what Gribble told him to do. He wouldn't do what Morris told him to do, and he wouldn't do what I had told him to do. I sent him telegrams and he'd either ignore them or do nothing. Of course, there was a difference of view as to what ought to be done.

Neither Bill Gribble nor Jack Morris wanted an open confrontation over this. My recommendation was for them to ask him to do it and if he didn't agree to do it, to ask him to retire. But they didn't want to do that.

Q: Why didn't they want to do that?

A: Because they had a great respect for his ability and accomplishments. And I guess they didn't think the issue was important enough to justify this kind of a scrap.

Q: Well, you must have.

A: I did, because I felt that he was wrong. He had had his day in court. If we didn't want him to do it then we shouldn't have told him to do it. Having told him to do it, if he wouldn't do it, we should have—

Q: Got somebody who would?

A: Got somebody who would.

Q: How did the Assistant Secretary of the Army come down on this?

A: He kept asking me why we weren't doing these things. I worked very closely with his office. We made a trip down there in the middle of the winter and almost froze to death riding around in the bayous in a small boat. During this trip, Veysey and Koisch disagreed about another project, the Cross-Florida Barge Canal, which had been stopped at the order of President Nixon.

At breakfast one morning Veysey and Koisch got into the most incredible argument about the Cross-Florida Barge Canal. Koisch, in his inimitable fashion, said to Veysey, “Sooner or later they would wake up, and Congress would vote the money, and they would dig the canal.”

Veysey was horrified, because as far as he was concerned, it had been stopped and the environmentalists had won. This was over, and to hear from this Corps of Engineers general that they were going to dig it, sooner or later—

Q: Scared the hell out of him, I suppose.

A: Veysey just couldn't understand it. I think Frank was wrong in that particular judgment, because the canal was dead politically. There was still a group of navigation interests in Florida that was interested, but they represented a relatively small political force compared with the widespread opposition to the canal from the environmental movement.

Q: That was out of Koisch's bailiwick.

A: It was, but Koisch had been the Director of Civil Works when the project had been stopped, so he was very familiar with the project and all the background and controversy. This had nothing to do with Koisch's immediate responsibilities. It was just a breakfast conversation about the direction of the civil works program. As far as Koisch was concerned, get the shovels and start digging, which, of course, was the very image of the Corps that Veysey deplored. When Veysey became the Assistant Secretary of the Army for Civil Works, he was determined to turn the image of the Corps around to an agency that was among the most, if not the most, responsive to environmental concerns.

Q: Which is the direction in which General Clarke had started it.

A: I would say Clarke was a middle-of-the-roader. He didn't want to shut down all the Corps' efforts. But he was very dynamic in reaching out toward the environmental community. Gribble was more passive.

This occurred in the Marco Island permit case. Ken McIntyre, who was my deputy, did most of the substantive work on this. When it came time for the Chief of Engineers to make a decision on Marco Island, I recommended to him that he deny the permit. Left totally to his own instincts, I doubt that Bill Gribble would have denied that permit.

However, when the staff had developed this fully, he satisfied himself as to what was going on, then approved our recommendation. I don't mean to imply that he was a

stick-in-the-mud. He wasn't. I am just trying to depict what I see to be his natural leanings, which were not to use the permit program to thwart development. He didn't see that as the role of the Corps.

Veysey, McIntyre, and I all thought Congress had put the Corps in this role when it enacted Section 404 of the Water Pollution Control Act of 1972. However, we had to explain to Veysey that he shouldn't have anything to do with a permit until the Chief had acted. This was hard for him to swallow, but we told him that he just had to wait. After the Chief had acted, then he could get the Secretary of the Army into the act if he wanted.

Since the Chief denied the Marco Island permit, that wasn't necessary. The denial of the permit was hailed by the environmentalists. This confirmed their fondest hopes—that the Corps in its administration of the Section 404 permit program would be a balancing force in development. Developers would no longer be able to run rampant.

So this satisfied Veysey. This was good. And I think, in the permit area, we did pretty well. Although there was another permit for some poor guy trying to build a bulkhead on Lake Washington, near Seattle, which was less fortunate.

A whole string of people had bulkheads to hold their land so they could have a good waterfront that people could bring a boat against. One poor guy in the middle of this string had never built a bulkhead. All he wanted to do was put in a bulkhead along this same line.

Q: Just like his neighbors had.

A: Just like his neighbors had. But the fact is that in the absence of a bulkhead, the water came in on his property, so he would have had to fill. The Army denied that permit. There was a great controversy over denying this permit. There was some tortured reasoning that it would damage the fish, or something, if he put in this bulkhead.

The guy wasn't going to fill more than about five feet of land. I don't know exactly how large Lake Washington is, but the number of fish that would have been damaged by filling that five feet was nil.

Q: Exactly.

A: This was one of many active controversies about reasonableness of these permits.

Q: General Koisch seems like an interesting guy. The thing that caught my attention was the sort of irony that when he was in civil works, he didn't seem that interested in pursuing studies to their conclusion. Of course, studies yield projects. When he was in LMVD, he was a very impatient builder.

A: That's an interesting comment. There must have been some studies he saw worth pushing. When he was the division engineer, for example, he was the one that got the Red River project going. If it had not been for his determination on that, the navigation locks on the Red River probably would never have been started.

Bill Gribble and I certainly didn't think they were a good project, but Frank felt that they were very strongly advocated by the interests down there, and he pushed them through.

He pushed construction, but he didn't see a lot of these studies as leading to construction projects. That's basically it.

Q: Were you still in civil works when Michael Blumenfeld took over as ASACW?

A: Yes, I was. That was involved with one of the toughest jobs I ever had, which was the water project review.

Q: The hit list.

A: Yes, by President Carter. I got to know Secretary Clifford Alexander and Mike Blumenfeld very well as a result of that whole exercise.

When Harold Brown was made Secretary of Defense, I wrote him a letter just saying congratulations. I got a very nice reply from him, which I think was probably a routine reply, but it was thoughtfully worded. I am not sure of the date, but I believe Wednesday afternoon I got a call from Harold Brown. It might have been earlier in the week. He said that the White House was considering stopping a bunch of these projects and asked me what comments I had. I said it seemed to me that as Secretary of Defense he should caution the White House that these projects had been authorized and the money appropriated for them through a very elaborate procedure with Congress. If some of them weren't what should be, the way to get them stopped was through working with the Congress to stop them. If the President just intervened and told the Corps not to do these things, there would be trouble.

I recalled to him all the trouble there had been over the Cross-Florida Barge Canal when it had been arbitrarily stopped by President Nixon. He said thank you, that sounded like good advice.

Then on Thursday, the 17th of February, 1977, we were all summoned to the White House. We went to the cabinet room in the White House. President Carter was there. Bert Lance, the Director of OMB [Office of Management and Budget]; the Secretary of Defense; the Secretary of the Interior; Jack Morris and I were there. Jack was the Chief of Engineers. I was the Director of Civil Works. Clifford Alexander, the Secretary of the Army, was there.

We went around the table. Every single person at that table recommended against announcing this hit list. All for different reasons. I was more than halfway around the table. Morris was sitting right opposite Carter. I was to the left of Morris. When it got to me, I said that I felt that everybody else had pretty well covered it except that the President needed to understand the provisions of the Budget Impoundment and Control Act. If he stopped these projects, it would be a de facto impoundment of funds, and he'd be in violation of the law on that. The Corps could not stop spending the money.



Lieutenant General Jack Morris, Secretary of the Army Clifford Alexander, Major General Graves, and President Jimmy Carter in the White House during the water project review.

Q: You told him that?

A: Yes. If he wanted to stop the projects, he would have to send notices to Congress because we could not legally stop spending the money simply on an order from him. He had to impound the money. To impound the money he had to send notice to Congress that he was impounding it. Well, that was an interesting thought that hadn't occurred to any of them.

Q: How did he react to that?

A: The President didn't pick that one up immediately. Lance, I think, picked up on that. Also, Stu Eizenstat, who was his counselor for domestic affairs and the staff leader for this action.

Q: Wasn't there a woman named Kathy Fletcher who was—?

A: Well, Kathy was the action officer, but Eizenstat was the one in charge of this for the President.

When we had gone all around the table, Carter said, "Thank you very much," but he was going to do it anyway. However, in view of what we said, he would let us advise him about the projects that should be stopped and the ones that shouldn't.

Eizenstat produced a memo with a list of projects to be stopped. I have the original in my files. Jack Morris and I were referring to the memo during the discussion. At the end it was left lying on the table, and I picked it up with my notes on the meeting.

On this memo were 35 projects. Carter left, and we were left to sit there around the table discussing the projects that should continue and those that should not.

Of the 35 projects, we concluded that there were 20 that should be included in the list of projects to be stopped. We gave that information to Eizenstat and Frank Moore, who was congressional liaison. Then we left. I think Eizenstat wrote it down in longhand.

They determined that they were going to announce this list on the 21st of February, which was a Monday. The 22d was George Washington's birthday. So maybe Monday was a holiday, too.

Saturday, Frank Moore reached me, and he started asking me about the Richard B. Russell Dam. The Richard B. Russell Dam had been on the list, and we had recommended that it be removed from the list mainly for two reasons. One, we thought that the dam was in the category of the ongoing projects that were economically

justified and didn't have serious environmental impact. It did not have the egregious problems attributed to the other projects.

We didn't think that the write-up by the people who prepared the list made a good case against the Richard B. Russell Dam. We thought it was mostly a fabrication—just a bunch of reasons put together, I guess, by Kathy Fletcher.

Carter, as governor of Georgia, had signed the state assurances on local cooperation on the Richard B. Russell Dam. So we thought in our perhaps too narrow logic, that it would look bad if Carter turned around and stopped this dam that he had previously agreed to. So we had said, "Don't stop Richard B. Russell."

It was obvious from Frank Moore's conversation on the phone that Carter saw it differently. He apparently wanted to demonstrate to the environmental movement that nothing was sacred, and that even this project that he had started would be stopped.

Moore kept asking me what the dam was like and how it compared with Buford and other dams in Georgia. He was obviously looking for ammunition to try to persuade Carter not to put this dam on the list. But he failed to persuade the President. It was on the list. Carter announced 21 projects on Monday, including the Richard B. Russell Dam.

All hell broke loose. Congress was furious.

We had proposed a study. I closeted myself with some of the top people in OCE, and we got the districts cranking. I was one of the main ones to work up a plan for this study. The study plan called for us to review all projects, which we did. In this initial screening we got down to 51 that deserved further study. Then we went into a drill to study these 51 more carefully. We finally got down to 17 that were recommended for reduction or change.

We worked day and night, seven days a week. It was really a fantastic thing we went through. I have most of the papers upstairs. I have been meaning, at some stage, to try to write all this up.

When we got down near the wire on the projects that required detailed study, we scheduled public meetings to hear views on these.

We tried to put out balanced announcements and we tried to work with the members of Congress. One member involved in Richard B. Russell was from South Carolina. We were discussing with him what we were going to do, and he was calling us repeatedly and appearing to us to be a supporter of the project.

He was wanting to see what we were going to say in our public meeting notice. We inferred from his tone and his questions that he was concerned that we not disparage the project in this announcement. We didn't intend to. We were trying to have what we considered to be a balanced description.

The next thing that happened was a telephone call from an extremely irate woman. It was not Kathy Fletcher. It was Kitty Schirmer, another woman that was working on this project with her. She said that the notice for Richard B. Russell was a distortion, that we had violated instructions, and that we should kill this notice. I said, "Well, I don't think that's possible. I think it's in the post office right now—10,000 copies."

There was a debate about recovering the notice from the post office. I suggested that the news media would have a field day with a story that we pulled 10,000 notices from the post office, if the post office would even let us do it. Finally, she said, "All right. But never again. You have violated orders." So it went out; that and the notices on all the projects went out. Generally, the reaction in the hearings was overwhelmingly in support of these projects, but not entirely.



Major General Graves with Representative Tom Bevill of Alabama in 1977.

Q: Sure.

A: We finally got it down to the point that we recommended eliminating 17 projects. We held hearings on more than that. We held a hearing on the Tennessee–Tombigbee Waterway. It was not on the list of 17.

After the hearings were over, we prepared a report in which we appraised each project and recommended whether it should continue or not. We delivered this report to the Office of Management and Budget and to Eizenstat. Then the White House staff did their own thing. They wrote their own project appraisals. They paid almost no attention to the material we produced. I went alone, with my notebooks, back to the cabinet room and met with President Carter, Bert Lance, Stu Eizenstat, Hamilton Jordan, and Jody Powell.

They were all there. They asked me about some of these projects. They asked me about the Tennessee–Tombigbee Waterway, and what the justification was. I told them it was coal. I told them about the power plants that used the coal. Carter said he didn't believe any of that. He thought it was all fabricated.

Then I told him that we had had quite a hearing on the Tenn–Tom and that there were six million people there. I meant to say six thousand. They all had quite a laugh about that. But that misstatement of mine got quoted by Bert Lance to a bunch of people and showed up in the newspapers. It was never attributed to me personally, but I felt, frankly, that their repeating that mistake of mine was a cheap shot.

Q: Because they did pull their punch a little bit, didn't they?

A: Well, you know, they set the thing up. We did the revocations, the Budget Impoundment Control Act actions. We went through a great drill. On the ones that Carter wanted to stop, we made up notices, and they went up to Congress, and we did stop some. The stoppages did affect some permanently. But basically it was one of many things that President Carter did that was flawed in concept and execution and that destroyed his ability to govern.

Q: I was going to ask you to get to that point, because you know, Dick Curl had been involved in all—

A: He was in Kansas City.

Q: Yes. And then in the Office of Science and Technology Policy, and I guess you were involved with that office, too, right?

A: I didn't have too much to do with that, not in the Carter era.

Q: Well, Dick Curl just oozed contempt when he talked about the Carter White House.

A: This was an example. We offered the alternative that if Carter wanted to stop these projects, the thing for him to do was to launch a crash study, aimed at the next year's budget. Congress had already acted on the budget for 1977, and we were spending the money. We told the President in that meeting in the White House on the 17th of February that he ought to have a study that would begin right then, and carry through to the summer—

Q: Which is what you were doing, in a way.

A: Yes. But the point is, rather than trying to stop the projects, he should have done that, and then his budget recommendations for 1978 should have been based upon the results of this study. If he wanted to recommend in that budget stopping the projects, fine. But to do it as he did wouldn't work, which it didn't.

Congress went ahead and appropriated money for most of the projects for fiscal year 1978. A few, like the Meramec Dam in Missouri, were lost. That was in [Representative Richard H.] Ichord's district, and he had been a strong supporter, but as the result of all this public support fell away. Ichord concluded that the public was no longer in favor of this dam, and we shut it down.

Q: And that, of course, is a process that Carter could have encouraged by studying it for a year, developing public support—

A: I think it would have worked much better for him, and it wouldn't have poisoned his relations up on the Hill. Contrast this with the Reagan administration. Reagan really used his first year in office to get a coalition going in Congress to pass the most dramatic and far-reaching legislation of perhaps his entire presidency—a whole turnaround on the budget.

He put together a coalition. He got them to redirect the budget, to reduce some areas and increase others. He cultivated the Congress and got this across. President Carter, with this water project thing, totally destroyed his relations with Congress

Q: Right at the outset.

A: Right at the outset. Those of us who discussed it at the time felt it showed that Carter did not appreciate the difference between the situation when he was governor and working with the legislature in Georgia, where the governor dominated things, and the situation here when he was President and working with the Congress. The President of the United States does not dominate the U.S. Congress the way governors in many states dominate the state legislature. Just a totally different situation. Carter and his advisors from Georgia did not grasp this.

Q: That's a very significant point.

A: That's the reason he thought, apparently, that with the support of the environmental groups, they would steamroller Congress. It did not have that effect.

Q: So the whole episode has an importance, really, that transcends water resource development.

A: I think it does. It is probably also true that this was the first serious challenge to the water resource program. Presidents had always basically gone along with the congressional desire for this work.

I don't mean that the Nixon and Ford White Houses had not been very skillful in limiting the amount of money spent on water resources, but basically, President Ford, having come from Congress, felt this was very important politically to the members of Congress, which it was, and he wasn't going to challenge them on that.

Now Carter's was the first serious challenge. As a practical matter, I think the Reagan administration has had a more drastic effect on the program.

Q: It has, indeed.

A: Because they have definitely throttled the money, and this [Assistant Secretary of the Army for Civil Works William R.] Bill Gianelli did. And, of course, unlike Veysey, who did not have strong ties with the White House, Gianelli did, and when he said things had to be a certain way, he meant it because he had the people in the White House and OMB that he was close to. Veysey lacked those.

In the Carter water project review, Clifford Alexander was very active. He and I went to meetings together at the White House. At the time of the review, Mike Blumenfeld was a special assistant. He became Assistant Secretary for Civil Works quite a bit later. Alexander had brought Mike with him when he came into the Pentagon. Mike was helping the secretary on a lot of different things. This was really Mike's first exposure to civil works.

Q: So it's a mistake, in a way, though, to compare Gianelli to Veysey. We should be comparing Gianelli and Reagan and their skillful approach to reducing the program to Carter's—

A: Yes. I think the point is Veysey was a Ford appointee, but the Ford White House went along with the civil works program because it felt this was an important program to the members of Congress. The Ford administration wanted to limit the amount of money spent. It didn't oppose the program in principle. It just didn't want to spend too much money.

Veysey was sort of on his own out there trying to bring about these environmental changes.

When you get into the Carter administration, you have this strong opposition, but this wasn't a preoccupation of Alexander's. He had a totally different agenda for the Department of Army in the equal opportunity area. Alexander tended to be supportive of the things the Corps wanted to do.

When we would describe the practical political problems that were going to ensue from this thing, Alexander could see that right away. We argued, not that the President was wrong to stop these projects, although we may have made that point as well, but basically, that he was going to do himself a lot of damage. Alexander could see that, and so could Blumenfeld.

Q: And Carter couldn't?

A: And Carter couldn't, and he did himself a lot of damage.

Then, along comes the Reagan administration. It is highly organized, to turn this program off. The Reaganites are a lot more skillful at how they have gone about it. Through their operations they have thwarted any new authorizations. Therefore, the program has wound down.

I don't know whether that will be turned around or not. I think perhaps some of these most urgent projects like the new locks at Gallipolis will get the go-ahead in this administration, because I think the commercial interests will keep working away at the White House and OMB to get these things done.

I don't know, but I think flood control, federally financed flood control, is pretty much a thing of the past. If the protection is needed, it is going to have to be done by local interests.

They have come up with a cost-sharing formula which says the local interests will provide all the money and then the Corps will build it. Well, I don't think they will get the Corps to build it. The local interests—the states—will build it themselves. Why should they take their state money and bring it in here to Washington for the federal government to spend?

The state water agencies can build that kind of thing. You can argue about whether they know as much about it as the Corps, but they can hire the Corps to come in and look over their shoulder and tell them whether the plans are right or not. They don't have to turn all the construction money over to the Corps to get the work done. The Corps won't do the construction unless the cost-sharing formula provides a substantial federal contribution to the construction cost. Whether the Reagan administration and Congress will reach a compromise on this, I don't know.⁴

A: There was an interesting dichotomy there in the Carter administration. President Carter felt strongly that he wanted to oppose water projects. He wanted to stop projects. He wanted to demonstrate that he was doing something. He wasn't too concerned about the reaction he was going to get in Congress.

Talking it over with people at the time, we felt that he was showing the attitude of a governor toward the state legislature in many states. I think Carter certainly felt this to be true in the state of Georgia. The governor dominated the political scene, and the legislature definitely tended to be under the domination of the governor. He had been able, in Georgia, to work his will with the state legislature.

So when it came to the water project review, he tended to view the U.S. Congress in the same way, that if he made a strong stand on what he believed in, then the Congress would go along. Many who had been in Washington felt that the balance of power between the President and the Congress wasn't the same as it is between a governor and the state legislature.

The Corps had the attitude that these projects had been authorized by Congress and the money appropriated for the construction through a well-established process. If this were to be set aside, then it would require us to go through the same process that we would have to study it, and then we would have to have public hearings, and then we would have to have a formal decision. We proposed in meetings with the staff at the Office of Management and Budget and then the staff of the White House that we conduct this review this way, that we have several steps, and that we end up with public hearings.

⁴They did in 1986 with the enactment of Public Law 99-662, the Water Resources Development Act of 1986.

The Carter administration wanted to have publicity about this whole process. So we said, “Very well.” At each stage we would have public announcements, releases of what we were doing.

There were a couple of hundred projects that had to be reviewed, because we were supposed to review all of the active projects. All the active projects of the Bureau of Reclamation were going to be reviewed by them.

We had a screening criterion to begin with, which addressed the economic feasibility and the environmental acceptability and safety. We were going to screen all the projects against these criteria. After that was through, we would have selected some number for further study. From that we would have a more detailed analysis of each of these. And then from that we would pick a final group that would be the ones that would be candidates for being stopped or changed.

We laid all this out. Everybody agreed—the Office of Management and Budget and the White House people that were involved. Kathy Fletcher was one of the people in the White House.

After the first go-through, we had 51 projects that had some question about them. It was time to announce this list of 51. In the meantime, there had been a din up in Congress protesting the whole proposition. The Congress had passed laws, the President had signed them, and they had been enacted to build these things. A President didn’t just set aside the law of the land—a concept that Carter really didn’t appreciate, in my opinion.

So we got the list of 51 projects ready, and I had it. We had been working 7 days a week, 12 hours a day, to do this work. The people in the Office of Management and Budget and the White House staff didn’t really care whether there was an orderly review or not. They just were interested in a political demonstration.

They hadn’t been very supportive. So I went over to the White House with this list, ostensibly to talk to the people there about the fact that we weren’t really getting the kind of close coordination that allowed us to move ahead on this fairly rapid schedule. The whole review was supposed to take less than 60 days to get all this work done. But we had all this disruption.

I was ushered into the office of then-Vice President [Walter M.] Mondale. Ham Jordan was there, and Jody Powell. The associate director for natural resources was there from the Office of Management and Budget, not Bert Lance or McIntyre. But the next man down. Mondale heard my complaint, but then the subject shifted to this list. Mondale

wanted to know whether the list had been provided to anybody. I said, “No, we’re not about to share the list with anybody until the White House approves it.”

So he said, “You make sure that nobody sees the list.” You see, Mondale was, of course, very knowledgeable in the ways of Congress. Mondale, incidentally, from his time as a senator from Minnesota had been a great proponent of various water works, such as flood control and navigation.

Minnesota has some very important water resources. So Mondale knew the issues very well. And he was definitely in a mood to limit the damage from this thing. He knew, of course, that since President Carter had launched this, it had to be carried through to some, hopefully beneficial, conclusion.

The President couldn’t abandon the thing. He’d been in office for only two months. He couldn’t just say, “My first major public effort was a stupid thing; I’m abandoning it.” It was stupid, but he couldn’t say that.

But Mondale wanted to limit damage. So the list of 51 never saw the light of day. We went on, and later there was a list of about 20 that were marked for trouble. Most of them went ahead. Only a few projects fell by the way, as a result of this whole thing.

Q: So he made his public statement, I guess?

A: Well, I suppose so. I’m not knowledgeable enough to pontificate on the subject of President Carter’s difficulties.

He had an uncanny sense for the views of certain groups, but a remarkable lack of grasp of the overall picture. In the case of this water project thing, he certainly struck a responsive chord with the environmental groups and the opponents of the projects. But he didn’t have a good perspective on the overall situation, and, least of all, the fact that the majority of Congress felt that this type of public works was very beneficial to the United States.

Q: Since you mentioned Minnesota, and, of course, the Vice President was from Minnesota, I guess that’s kind of a microcosm there of the whole issue. Minnesota depends very much on its water resources for commerce to get its farm products to market. And it has its two major ports, Duluth and the Twin Cities. And yet Minnesota has a very active environmental group. You wind up working with a state that is for water resources development and a state that is for environmental protection. It must be very hard to deal with that.

A: It was very hard. When I went up there to be division engineer in the North Central Division just before Christmas of 1970, [Major General Charles I.] Chuck McGinnis, who was later the Director of Civil Works, was the district engineer in Saint Paul. And he was wrestling with this.

The district had had some hair-raising experiences with projects—flood control projects, dams that had been proposed and had been under study for years—some as much as ten years. Right then and there in the late 1960s, early 1970s, these flood control projects were coming up for the final public hearings before the district engineer made his report. That would have been forwarded into Washington to the Board of Engineers for Rivers and Harbors as to whether there should be a project.

The environmental movement was very active. The Corps was clobbered in these public hearings. Generally, the hearings were viewed as an opportunity to demonstrate public support for these projects. But in the hearings for these projects, there wasn't support, or support was minimal, and there was vehement opposition. The Corps, perhaps not for the first time, was caught in the position of presenting a recommendation that didn't have strong public support.

This is the antithesis of the philosophy of the civil works program. The civil works program was the Corps of Engineers out there doing for the citizens of the United States what they wanted done. Here they had been working away on these things three, four, five, six, seven, even ten years, and they came up with their report as to what was to be done and the citizens all got up and said, "We don't want that done." Minnesota epitomized that problem for the Corps because of the swing in sentiment up there away from a development ethic to a preservation ethic.

Q: I think it may be going the other way now in Minnesota, actually.

A: The problem with the preservation ethic is that it is economically stagnant. If you're concerned about jobs and economic development, it's an illusion to think that you can pursue that without disturbing the environment. If you're going to preserve the environment in its natural state, then you're not going to get the kind of development that creates a lot of industry and jobs. I think perhaps there after the tremendous economic growth of the '50s after World War II and extending into the '60s when the economy was going great, there was a tendency to feel that all this was going to take care of itself. The environmental movement felt, "We've had all the development we need. Now we should preserve the environment."

I think since then it's become evident that you have to have some development if you're going to keep creating jobs and have prosperity.

Q: Quite a few of the people in Washington, I guess, criticized Colonel [Lieutenant General Max W.] Noah, who was after McGinnis in Saint Paul, for going too far over toward the environmentalists.

A: Yes. But Max just did an outstanding job in his relations with the local people. Minnesota wasn't going to support any more development work than recommended. I just think Max did a good job of fitting the Corps to the scene. There may have been people in Washington that felt we should be trying to do more development work in Minnesota. But you can't do any of this Corps of Engineer civil works without the local support. If you don't have it, then you shouldn't be trying to pursue it.

Q: Speaking of local support, when you came to the Directorate of Civil Works, Senator [William] Proxmire—just about then—asked that the LaFarge Dam be stopped.

A: That's an interesting one because that's the one that Governor Lucey had tried to stop. Lucey had written a letter when I first became the division engineer of the North Central Division. He'd written this letter to Fred Clarke asking that the dam be stopped.

Our response to this was to go to see Lucey. Chuck McGinnis and I went to Madison and met with him. We said that we would be willing to have a review of the project, but that there was a lot of support for it among the local people.

Lucey, who had sort of gotten his neck out a little bit on this, said all right. He had a one-week review, which was conducted there in Madison. McGinnis went down there for that week. The review team included people from the Corps and from the state. They heard a lot of people comment on the project.

They prepared a report which talked about the flood problems on the Kickapoo River and the solution. When all this was done, Lucey said he thought the project should proceed.

Lucey also told me, when I saw him at several meetings after that, that he had been tremendously impressed with the responsiveness of the Corps and McGinnis and myself and with the way we had come in and done this review.

That didn't last because Lucey was a very charming guy, but he wasn't resolute. In his case, it was a little bit who had his ear at the time. The same environmental people who had challenged LaFarge earlier, after about two years, came along. Again, Lucey was on the networks saying that he had questions about LaFarge.

Also, there was a change in congressmen. The member of Congress who had supported the project all along was defeated for reelection and there was a new congressman from the area.

So over time the enthusiasm for LaFarge waned. Nevertheless, the construction went ahead. They built the intake structure and part of the embankment. They were nearly ready for closure when the water project review took place.

LaFarge was one of the marked projects in that. It had problems on its benefit-to-cost ratio. It had problems because it was a shallow lake and there was a lot of concern about eutrophication in these lakes when they were not deep enough.

Wisconsin was no longer enthusiastic about it, and the congressman from the area wasn't. The people that had been flooded out time and again by the river ended up being a minority, and it got dropped.

It's hard to say about a project like LaFarge. I haven't followed the flood history since then. I think it was neither as good as some people claimed, nor was it as bad as others said.

Q: Which is usually the case, isn't it?

A: Yes. But they didn't do it.

Q: Right. Did you get into the whole issue then of nonstructural solutions?

A: There were proposals for this, and the Corps thought this was great. OMB thought it was terrible because they could see a lot of money being spent this way.

The Corps came up with an excellent nonstructural project for the lowlands upstream on the Charles River in Boston. In this project the federal government was going to help acquire a lot of the lowlands along the Charles River that would have been developed. If they were developed, they would have been filled. Then this natural reservoir which had helped to ameliorate flooding on the Charles would have been filled up.

The Corps did pursue this, and the Charles River project was carried out. But OMB was inalterably opposed to this type of project because it got the federal government into paying a lot of acquisition costs for land.

Prairie de Chien [Wisconsin], of course, was another case. It went ahead. But once OMB focused on the implications of these projects, they became a major policy issue.

This is a big subject which we really don't have time to explore, the whole question of water policy. If some of the policies that the Corps was proposing had been adopted, the costs to the federal government would have been billions of dollars.

The logic was this. The federal government has a responsibility to help with flood control. In many cases, the best flood control is to acquire land and by this means prevent its development. Therefore, the federal government is going to buy billions of dollars worth of land in the flood plain.

OMB took one look at that and said, "No way do we want to allow a policy like this to become embedded in law." Congress may authorize Prairie de Chien, or Congress may authorize Charles River. But we don't want these projects to become precedents so that any time you have a lowland like this, you can get an authorized project.

You can show some terrific benefit-cost ratios on projects like this. So OMB fought this every way they could. Basically, they managed to let Prairie du Chien and the Charles River project be isolated, rather than the wave of the future.

I was a member of the Board of Rivers and Harbors when I was a division engineer, and during my brief time as Deputy Chief, I became president of the board. There was a stream of these coming through then, but they never made it. Basically, they didn't make it because people decided that the federal government shouldn't be in this business.

Q: I'm kind of surprised to hear you say that nonstructural solutions had advocates in the Corps.

A: Oh, yes. There wasn't any problem there because the Corps is very adaptive. Bill Cassidy and Fred Clarke were very innovative. When they saw the way that the sentiment was running, they responded. Perhaps there were some people who had been in structural work all their lives that didn't agree. But not the leadership. If this was the way, if these nonstructural solutions were the way to go, the division engineers and the district engineers thought that was great. But OMB was worried about the Treasury.

Q: Which was a legitimate concern of theirs.

A: Oh, yes. That was all right. In a democracy, you have these checks and balances. You count on these opposing things to produce some measure of sanity.

Q: When you talk about General Clarke and adaptiveness, I think about the Environmental Advisory Board [EAB].

A: That was a terrific idea, and it was extraordinarily successful at the beginning.

Q: In what way?

A: Because it did make a bridge to the environmental movement. The people that were selected for it at first were leaders of the environmental movement. The fact that they were participating in the Corps' planning, or influencing it, had a very beneficial effect.

Some board members wanted to get into the specifics of projects. But Fred Clarke and Jack Morris were very skillful in keeping them away from that. There were some comments, but, by and large, they operated at the policy level, and they didn't get into evaluating specific projects.

As time went on, the people who became members of the board were more conservative. At the beginning, they represented the leadership in the environmental movement. Later, more of them represented the status quo element. So the effectiveness of the board diminished somewhat. They weren't as much on the cutting edge.

When Vic Veysey was the Assistant Secretary of the Army for Civil Works, he tended to deprecate the Environmental Advisory Board as not representing the avant-garde of environmentalism. He associated with a different group that was more radical. We started out trying to involve Veysey in the Environmental Advisory Board. He did come to the meetings and he did participate. But he had another set of contacts that weren't on the board that perhaps were more activist.

Q: How did Mr. Veysey and General Gribble get along?

A: Poorly.

Q: Why?

A: I guess they just thought differently.

Q: Reasonable men can think differently and still get along.

A: They were both very gentlemanly to each other, but they didn't agree on things.

Q: Which, I guess, accounts for your role as kind of a—

A: That was so. Jack Morris, who was the Deputy Chief, had tried to somehow fill in. But that hadn't worked too well because he himself didn't want to do everything Veysey

wanted. So when I came along, I was the last hope of Veysey. But I'm sure that after he dealt with me for a while, he probably gave up on me, too.

Q: General McIntyre told a colleague of mine that Mr. Veysey tended to treat General Gribble with contempt.

A: I think that the problem was something like this. Vic Veysey was a political appointee, and, I think correctly, his view was that the political appointees in any administration are supposed to set the policy and the direction.

The fact is, the Corps had tended to set its own policy and direction—in earlier administrations—generally in accord with the national consensus. The Corps was a group in the executive branch with whom Congress dealt directly. Some Presidents resented this. Others accepted it as a fact of life and didn't get too upset.

The Corps reported to the President as commander-in-chief. But it also dealt directly with Congress. And the Secretary of the Army had never taken a great part in this, I guess if you go back to the '30s. [Harry H.] Woodring was the Secretary then.

The introduction of the Assistant Secretary of the Army for Civil Works presumably introduced a political appointee to deal with these issues. At the time the position was originally proposed, it was thought that the Corps was losing out because the other big water resource development agency—the Department of the Interior—had a series of political appointees who were dealing with these issues, but the Corps had nobody except its career people—military and civilian. The Corps needed to have a political appointee. That was the theory.

It wasn't very perceptive because the political appointees, by and large, have had a different agenda. Their agenda was not to work with Congress. The agenda was to throttle the program because of not wanting to spend money. So there was always tension when the political appointee came in. Here he saw this organization with this labyrinthine relationship with Congress. And he wanted to get across the lines of communication. It's a tough job.

Q: Yes. I think the phrase that General McIntyre used, in fact, was that Veysey tended to talk to General Gribble as a parent would to a child, that he did talk down to him and this upset him a great deal.

A: They were so different. Veysey was a politician through and through. Gribble was a career government servant. They just had a different view of the world.

Q: By the time you'd left civil works, you'd seen the project planning process in the division and seen it from the headquarters. How efficiently and how well did it work?

A: It didn't work as well as it should. It's interesting because Jack Morris was very anxious to get this thing rolling. He came up with a lot of good ideas. And I spent a lot of time as division engineer on this. When I was a member of the Board of Rivers and Harbors, I had looked at it and spent a lot of time trying to get an efficient program set up in which you could do a study in three years and decide up or down.

What basically thwarted this was the fact that the process became so complicated with environmental impact statements and public hearings and the like that you just couldn't do it.

If you had a simpler idea—for instance, if it was a flood, you went out and built a flood wall or channelized the river or built a dam—you could do it. But when you had to consider everything that happened as a result of this construction, the environment was just too complex.

Can the planning process cope with these complexities? The problem is epitomized by the Locks and Dam 26 project. They wrote an environmental impact statement for one lock, which basically was not too hard because one lock was simply required to maintain traffic where it was.

So the environmental impact statement said, if we build one lock, it won't be any different from what it is now. Then you start trying to come to grips with two locks. If they built two locks, this would certainly open the way to a much greater flow of traffic. When you start trying to analyze all the environmental and other effects of doubling or tripling the barge traffic on the Mississippi River and all the dredging and everything, you could study for a thousand years and you wouldn't get it right.

When you were in an era where you didn't really care about all these secondary effects—you were mainly worried about whether the primary effect of more traffic was good—then fine. But if you get to all the secondary effects of this change, for example, and the dredging and the silting, it's endless. It's beyond man to divine. After they've built these projects, they don't know whether they're beneficial—for instance, the Aswan Dam. So how in the world could they make a plan in advance to know? It's too complex.

Q: Bill Badger, when he was district engineer of Saint Paul just a couple of years ago, complained to me that the civil works staff at OCE was full of termites and technocrats—that was his phrase—who studied a project to death.

A: Well, I think he's right. But, you see, in the American political process, this may be a way to deal with some proposed action that's not agreed to.

If you understand politics, there's a bunch of people that want to build a dam. There's a bunch of people that don't want to build a dam. One way to handle this is to have a study. Then the guy who's advocating the study is viewed as a hero by both sides, whereas if he tries to make a decision, he's probably disliked by one side or the other or both.

Badger is right about the fact that studies do not produce projects. But, if there's not a public consensus to build a project, the study may be the best way to delay it.

Q: There is a political incentive to continue studying, is what you're saying?

A: Yes, that's right. That's what I'm saying. I'm saying that the whole ethic of the civil works program was that this is what the public wanted. If you don't have a consensus, then forget it.

Q: How well were you impressed with the senior civilian staff in civil works?

A: We had a good staff. Homer Willis was there at the time. He was then the assistant chief of engineering, then he went down and was the chief of engineering in the Lower Mississippi Valley Division. Then he came back and became chief of engineering in the Civil Works Directorate.

Q: George Brazier was in CONOPS [Construction Operations Division]?

A: George Brazier was in CONOPS. He was a very capable guy. Irv Reisler was in planning, but then Alex Schwaiko took his place.

Let's see. I'm trying to think about policy. Of course, Joe Tofani had gone by that time. Irv was moved from planning to policy for a while.

We had good people. I was very much in favor of the evolution that occurred after I left, which was to move Alex Schwaiko from planning to policy. Then Lew Blakey became the head of planning. That was after I left, but that was something that I was in favor of. I could list a whole string of guys that were very capable in civil works.

The policy guys had a very tough time of it because, as I mentioned earlier, the administration didn't want policy. The Corps could come up with all kinds of policies. They used to say, "We don't care what the rules are. Just let us know what they are." OMB's position on this thing, which they even said openly, was that the best bet for

them was to have no rules. Then nobody could write any studies because they wouldn't know what rules to follow. And they practiced that deliberately.

There was a lot of effort on the part of Congress to get this sorted out. But there just wasn't the sort of coalition there had been in earlier times to cut through all this.

Q: I talked to Lew Blakey, and I told him what you had told me about how hiring him had been the smartest thing you had done there in Chicago, and he was really flattered. He said he had applied for the job at Missouri River Division in 1970, which was open when General Morris was out there. And he went out there, and he said as soon as he got out there, he knew he wasn't going to be picked because he didn't fit the image of a chief of engineering.

He was 37 and not 57—that's what he told me—and he'd never been chief of engineering in a district. So he knew it was a pro forma thing, and he left there knowing that Lloyd Duscha was going to get the job.

A: Yes, Lloyd's a very good man.

Q: Oh, yes. That's not the point, of course. He said when he went to Chicago later to interview with you after General Dunn had had personnel put him on the list, he said he didn't know why you hired him. But he said he thinks it might be that because you had been a 19- or a 20-year-old senior at West Point, you understood that someone his age would not necessarily not be able to do the job.

A: I thought age was in his favor. But more important, I thought that he would bring a fresh view, and they very much needed that. That place really needed work. I think we discussed that earlier.

Q: Yes, we did.

A: I think the fact that Lew was young was in his favor, so far as I was concerned.

Q: Well, apparently that wasn't a conventional Corps of Engineers' view at the time.

A: Maybe it wasn't. I haven't thought about it.

Q: I just talked to him today, and he thought that was worthy of note. So I had to bring it up.

A: That got him away from military construction and into civil works, where he's been ever since.

Q: He says he doesn't regret it.

A: No. When he left Chicago, he went from engineering to the policy job, and he worked that for a while. Then they decided to swap him and Alex, which I think was a good thing.

Q: When you were in civil works, were there reorganizations of the directorate?

A: No, I don't think so. Jack had been reorganizing it every six months for the preceding three-and-a-half years. And I decided it didn't really need any more. There might have been some open issues that had to be solved. We had to change people. Irv Reisler retired during that time. We had to fill some jobs. But I don't remember changing the organization during my time. I felt there had been enough of that.

Q: There has been talk about reorganization in the past few months, and it's something that comes up frequently, the merging of the civil mission with the Bureau of Reclamation's work. Every time this happens, the Corps defends the civil works' organization as a crucial reserve for military mobilization. How valid is that contention?

A: We probably aren't likely to face exactly the same thing we faced in World War II again. Our whole posture is totally different. You have to remember that the Army before World War II was around 200,000 people, and it grew to 8 million during the war. Now the Army is about 730,000. So we're not likely to see the same kind of extraordinary growth, and we have a much larger set of facilities now, much more adequate peacetime facilities than we had then.

But the basic concept that we need a reservoir that will allow us to expand military construction is a valid one, and the Corps has been blessed with having the civil works and the military construction to balance each other. When the one was high, the other was low. So that aspect, I think, is very valid. And I think it's right for the Corps to keep working on the mobilization capability of the construction industry.

The Reagan administration came in, and this was one of their pet concerns, the fact that our ability to mobilize was much diminished.

Q: That's right.

A: They did work on this. However, they found out that the cost of redressing this was pretty substantial. So the Reagan administration hasn't pursued this with as much vigor as they talked about in the beginning.

But I think it's a valid concept that the Corps must be prepared to do a much bigger job in war than it does in peace.

Q: Plus the only time the Corps gets the opportunity to exercise this mobilizing capacity or capability is in civil emergencies.

A: Yes, and that's a very valuable asset. The Corps, because of its organization and its adaptive ability, has always been the most valuable organization in these emergencies.

They've maintained a pretty good relationship with the emergency group—whatever it was—FEMA [Federal Emergency Management Agency] today, but it's had a lot of precursors. There's a certain amount of politics in this, but in the end, what has paid off has been the fact that the Corps could organize and get the work done.

Q: You went to the Deputy's job in July of '77.

A: Right.

Q: Were you involved in your choice of successor in civil works?

A: To a limited extent. I think I talked it over with Jack Morris some. When Jack became Chief, I think there had been an assumption that I would go up to be Deputy Chief right away. I didn't want to leave because I had been in civil works less than a year. I suggested to Jack that it might be a good idea to get somebody else to be Deputy Chief and let me stay on as the Director of Civil Works. And, of course, that's what happened.

[Major General Robert C.] Bob Marshall was over in the Pentagon in the ballistic missile operation—Safeguard. I suggested to Jack that we ought to get Bob back into the Corps. Of course, he was quite a bit senior to me. I suggested that we should bring him in and let him be the Deputy Chief of Engineers and then he could go down and be the Lower Mississippi Valley division engineer. That's what Jack and I finally agreed on. Jack thought that was an excellent idea, and he did that. It worked out very well. It allowed me another year.

So I stayed on in civil works for a year longer than I otherwise would have, and then I moved. Bob became the deputy chief, he stayed for a year, and then he went to be the Lower Mississippi Valley division engineer. When that happened, I moved up. So I was very much involved in choosing Jack's successor as deputy. When it came time for me to move up, Chuck McGinnis was the logical person to take my place.

I would never have been involved in the water project review, if that hadn't taken place, because I would have already been Deputy Chief.

Q: Were you sorry that you —

A: No. I would have stayed in civil works as long as I could. That was my lifelong ambition—since the time I was a little boy—to be the head of the civil works program.

Q: I think I may be getting ahead a little bit by following this line, but did that have some consequences later on for you in terms of your assignments? Did you want to be Chief of Engineers?

A: When I went to be Director of Civil Works, I felt that I was going to be one of the competitors to be Chief. I don't know that I ever had that much chance.

Bill Gribble left after three years as Chief. When he decided to retire, Jack Morris was hands-down the leading candidate. Jack used to say that if Gribble had waited another year, then Jack would have been older and I might have had a better chance. But I don't know. Sure, I would have liked to be Chief of Engineers, but when they picked Jack, I felt that he was the leading candidate. He and I were very close. My main interest was staying on in civil works. I said, "Why don't you let me do that?" He said, "Fine."

Deputy Chief of Engineers, 1977–1978

Q: What was it like working with General Morris? You're two very different people.

A: Yes. Each of us respected the other a lot. I certainly did respect him, and he certainly listened to me. I tried to get him to think things through before he did them.

Q: He had kind of an experimental inclination?

A: He had an experimental approach, and I argued that he shouldn't do this as much as he tended to, that he should try to get something set before he put everybody into it because when you drill the troops back and forth, you lose the cutting edge. My philosophy was, you made up your mind what you were going to do and then that was it. If the people knew that that was it, they would really make an all-out effort to make it succeed; if they thought that you were likely to change your mind at some point, they'd kind of let things go. They'd wait and see.

But it's funny. People have to get used to that. Very often people that worked with me didn't believe that in the beginning. They couldn't believe that this guy meant this. Then after six months, they believed.

You know, it produces results. But it's not the only formula. That's my approach. Spend time, think through what you're going to do. Get people's views. Talk it over. When you finally decide that that's it, that's it. Then you really try to do it that way. When people come in and want to do it differently, say, "Listen, we talked about this for three months. This is the way we're going to do it."

Q: Did General Morris ask you to concentrate on any particular aspects of what the Corps was doing?

A: When I came up to be Deputy Chief of Engineers, he wrote an interesting memo which I didn't pay too much attention to, frankly. It was all about the fact that I wasn't supposed to interfere with the Director of Civil Works.

I told Jack, fine, but that I was the Deputy Chief. I've forgotten about how it was worded, but it was all about how I was supposed to look after the military construction. Anyway, I wasn't supposed to interfere with the Director of Civil Works.

That isn't what it said. But, of course, Chuck McGinnis and I were long-time associates. He kept asking me, "What do I do now?" I don't mean that he didn't know what to do, but he wanted my views of what to do.

You know, Morris had his views. But McGinnis never hesitated to consult me on what I thought of these situations. And since I had been nursing these things for two years, I had views.

Q: Sure.

A: I remember one of the things that came to fruition had to do with the controversy over the water supply on the Potomac. There had been a real problem with low water. I had written a letter to the editor of the *Washington Post* about the sharing of water between Maryland and Virginia and the District. Actually, Maryland and Virginia both wanted all the water, and the hell with the District.

We had a black Secretary of the Army and the District had a black mayor. I was trying to get the political groups in the District to stick up for their water. My feeling was that if they would get on board, neither the Maryland nor the Virginia jurisdiction would stand a chance. That finally came to pass.

By the time it came down to it, Chuck McGinnis was the Director of Civil Works. They had a big meeting in OCE. Secretary Alexander was involved, and all this was to sort out the division of the Potomac River water.

That's just one example. Nobody completely solves a civil works problem in one tour of duty. They go on. The guy who knows what he's doing is going to talk to his predecessor to find out what had been done before he came on board.

Q: People who worked with General Morris sometimes observe that he didn't like to face controversial issues directly. Did you find that to be true?

A: I think that's a little harsh. I think Jack tried to find a way to handle controversial issues that didn't confront individuals. A controversial issue has several sides to it, obviously. One way is to make everybody confront the issue. Jack was always trying to find a solution where everybody would be satisfied.

In other words, he felt it was possible—and very often he was right—to find some solution where nobody had to feel that he'd been put down. I think that in trying to do that Jack may have created the impression that he didn't want to face it.

He knew what the issues were. His view was that a leader could figure out a way to come up with a solution in which there was something for everybody. Now sometimes that was not the right way. There were some issues where that wasn't true. Sometimes I guess compromise was not the best way.

Q: Later, in the context of the Israeli project when there were officers who refused to go and they weren't made to retire, one officer who was involved in one of those issues who did go told me that it was the Deputy Chief's job to make sure that people did what they were supposed to do. This takes me, in a way, back to what you said about General Lee, who had been more or less a disciplinarian on Eisenhower's staff.

A: I don't think it's necessarily bad tactics to make the deputy do the harsh work.

Q: Does the deputy do the harsh work?

A: Yes, and that's fine. Most deputies don't mind that because, if the deputy calls somebody and says, "All right, this is it," particularly if the Chief of Engineers has told him that's the way it's going to be, he feels, "Well, this isn't my responsibility. The Chief made this decision." Yes, I think it's better for the Chief to stand back from these things.

It's no different from the way the Navy operates aboard ship. They have an executive officer. He's the one that deals with the crew. The captain remains a little aloof. There is no question in the minds of most people aboard ship that the captain's the ultimate authority and that the executive officer operates under the guidance of the captain.

This is a very important point which I mentioned to Nancy, and she's always kidding me about it. If you're in a negotiation, it's far better to send in somebody who isn't the ultimate authority, because if you sit down at the table and you have the power of decision, then you're under all kinds of pressure from the other negotiators to give way. But if you're there on instructions and the guy keeps putting heat on you, you can say, "Well, I'll have to take that back."

So, it's an interesting phenomenon. But life is one big negotiation among people. So very often, it's much more effective to deal with an issue with somebody that doesn't have the authority. Send him in. The psychology is that he can deal with it, he can talk it over. "Well, yes, we'll have to take that back and we'll discuss that." Whereas if he's the deciding authority, he's sitting there and the guy says, "You know, I want to do this thing," what are you going to do? "I'd like to think about it overnight." That really is the image of a guy that's indecisive.

But if the guy that's sitting at the table says, "Well, I don't have the authority, I'm going to have to go back—" So it all depends. If you're at Gettysburg and you have to decide on Pickett's charge, you can't operate that way. So I'm not talking about what applies to combat. But I'm saying in the day-to-day, week-to-week give-and-take, sometimes a negotiating posture where the guy that's doing most of the contact work doesn't have the authority may be an advantage.

Q: Did you fill that disciplinarian role when you were deputy?

A: Yes. I dealt with a lot of issues. Jack and I talked things over. Sometimes he wanted to handle things. But a lot of things, I handled for him. That was fine. That's what I felt was my job. I think that's the way the Chief ought to operate.

Q: I remember when you were talking about General Lee when we first starting talking about World War II that that was the role that he filled on Ike's staff.

A: Yes, but I think that was a little different. He had his way of handling things. But I'm not sure there was the same understanding between him and Eisenhower that that was the job that he was doing.

Q: I see.

A: That's the difference I see there.

Q: Is there something else I ought to ask you about that period between July of '77 and February of '78?

A: I don't believe so. I know that there was a lot of discussion about reorganizing the Office of the Chief of Engineers and that the organization that Jack kept going over in his mind is what now has ultimately come to pass.

Jack had this idea that civil works was very neat, that the Director of Civil Works was responsible for everything regarding civil works; and that military programs were very messy because there were all these different people. He wanted to have a Director of Military Programs. I said, "This is what the Deputy Chief of Engineers is supposed to do." It is messy. But the reason it's messy is that the Corps of Engineers' position in the military construction business is quite different from its position in civil works."

In civil works, Congress has authorized this work, and it's all under the Chief. In military construction, the Chief is a staff officer on the Army staff. He's all enmeshed with this. So it's wrong to feel that you can make the two equally clean and clear cut.

While I was there, he was deterred. After I left, they went ahead and had a Director of Military Programs. And then, of course, it's gone through several evolutions since then. I'm not a great believer in reorganizations.

Q: Why? Just because of the instability that they—

A: I think if you put more energy into whatever the system is, it will produce more results. During the time of reorganizations nobody gets anything done. I don't mean that there aren't things that require change. But a lot of the reorganizations are just drilling back and forth. I'd much rather get on with it.

Defense Security Assistance Agency, 1978–1981

Q: What was March '78 like? What kind of a choice was that for you?

A: Jack Morris was talking to them about various three-star jobs for me. He was very supportive of my getting a third star.

I had known [Assistant Secretary of Defense for International Security Affairs David E.] Dave McGiffert quite well because he became Under Secretary of the Army when I was exec to Stanley Resor. In fact, I used to joke that I went on Dave McGiffert's

honeymoon with him, which wasn't correct at all. But while he was Under Secretary of the Army, one of his jobs was chairman of the board of directors of the Panama Canal Company.

He used to have a meeting down in Panama early in the year, which was the dry season. Dave and his new bride went together to this meeting. We flew in an executive jet down to Panama by way of Puerto Rico, then after the meeting back to Puerto Rico. Then they were supposed to take a sailboat and go to the Virgin Islands, to Saint Thomas.

However, he got called by McNamara to come back to Washington for some personnel study. So he didn't get to go on his own honeymoon. And neither did I, of course.

I was with them during this whole plane ride. So I had known Dave for nearly three years during the Johnson administration. He was the Assistant Secretary of Defense for International Security Affairs and the Director of the Defense Security Assistance Agency [DSAA] reported to him.

When it came time to select a successor to [Lieutenant General] Howard Fish of the Air Force, who'd had the job for nearly four years, I was a good strong candidate. It was sort of the Army's turn.

I didn't know that much about military assistance. I had not had a job in the program. I had had a string of jobs involving foreign contacts—Panama Canal business and, as we discussed, a lot of work with England about nuclear weapons when I was with the AEC. I'd been in SHAPE for three years. So I was not a novice to jobs where contacts with foreign governments were important. But foreign aid itself I had not done.

Q: Were there other things that you were thinking about, other possibilities that looked interesting to you?

A: There was a three-star job as Director of the Defense Nuclear Agency [DNA]. But at the time, a Navy admiral had that job. So I really wasn't a candidate.

Q: That would have been an appropriate place for you.

A: That would have been, although when I was the AEC Director of Military Applications, we used to think that DNA didn't really have much to do, compared to what we did. But I think that was a little unfair. It's a very important job and they've done a lot of good things. But the timing was such that, if I were going to do something more, the DSAA opportunity was the main thing.

Q: I never knew that Mr. McGiffert worked for Mr. Resor. Of course, I knew that's who you worked for.

A: Well, McGiffert is very much a Democrat stalwart. He started out when he came to work for McNamara as his head of congressional liaison. That job was the Assistant Secretary of Defense for Congressional Relations. He had had that job for some time.

When Resor first came down, he was the Under Secretary of the Army. Stephen Ailes was the Secretary. After three or four months, Ailes left and Resor became Secretary. Then McGiffert was to come down.

Resor came in March or April and became Secretary in July. McGiffert didn't come down as Under Secretary until late that fall because McNamara had him doing several important things. But I knew him very well from those days.

Q: He survived the change to the Reagan administration, if I am not mistaken.

A: No. Nobody survived.

Q: I thought maybe he did.

A: No. [Robert W.] Komer had become Under Secretary [of Defense] for Policy. They weren't interested too much in what Komer had to say, or McGiffert either. No, when the Reagan administration came in, they had a very strong view that most of these things had been controlled by the Democrats for too long. They wanted a change.

Q: While you were DSAA, one journalist—is Michael Klare's name familiar to you?

A: I don't remember him, no.

Q: Actually, he's not really a journalist. That's not fair. I think he was a fellow at the Center for Policy Studies and he has a recent book called *American Arms Supermarket*. It was in a *Harper's* article that he referred to you as the nation's top arms export official.

A: Well, that was right. But I think that job has gone through many evolutions. If you go back to the McNamara era, the man who had that job was a civilian named Henry Cuss. McNamara had the view that the foreign sale of U.S. weapons was an important way to distribute the fixed costs. The larger the production base, the less each weapon would cost. He had Henry Cuss going around the world selling U.S. weapons. That was an economic view of the world.

Later, particularly in the Nixon–Ford years, it was much more political. I don't mean the weapons weren't going to be used for military strength. But the whole business of the arms trade was viewed as political.

When Carter came along, there was opposition to this whole idea. We had made a great mistake. We had exploited arms first for commercial purposes and then for political purposes, and it had all turned sour.

Of course, the root of all this was the failure in Vietnam. Vietnam represented the essence of the concept that, if we supplied weapons, training, and support to allies forward and close to the Communist periphery, then the wars, the battles, the struggles would be there. All this would keep it away from the U.S. These people would be surrogates for us. This was the whole concept of a forward defense. This was the Nixon Doctrine. Let them fight the wars. We'll supply the materiel.

The Carter view of this, the viewpoint of his administration, was that this concept had gotten us into a lot of trouble. By the time I got there, the concern—and this was a very deep concern of McGiffert—was that a whole arms transfer apparatus be responsive and be controlled by the political leadership and that we not engage in arms transfers unless a decision was made politically that this was what we wanted to do.

They had a huge kick on this. My job wasn't particularly to sell weapons. My job was, once the political leadership had decided what they wanted to do, to see that that was done.

That was all right with me. There were a bunch of people that had been in the business a long time that felt that the whole concept of security assistance and military aid was one of the keys to our security and that a regime that throttled this was hurting our security. The whole Carter thing was anathema to them.

Since I hadn't grown up with this my whole life, it wasn't as hard for me to accept the fact that McGiffert was deciding these things, or Harold Brown or whoever. I tried to carry out what they wanted done. In retrospect, maybe sometimes they went overboard.

Q: Now that you mention it, I think your predecessor was really appalled by Carter policies, wasn't he?

A: May 19th, 1977, was when President Carter first put out his policy that arms transfers would be an exceptional tool of policy, not a routine instrument.

Howard Fish, my predecessor, was a very shrewd guy. Because he knew the business as well as he did, he was quite effective in fixing it so that, notwithstanding the policy, the country was able to do what it had to do.

The truth of the matter is that the Pentagon saw the thing two ways. The Pentagon—McGiffert, Harold Brown, those guys—did not want to be viewed by the administration as not supportive of the President's policy. But they also had been around a while. After all, Brown had been in the Pentagon back with McNamara. They knew a few things. And they knew that before all was said and done, arms transfers were going to be needed.

So they wanted to prevent the Carter White House from painting itself into a corner. They didn't want to do for arms transfers the kind of thing that had been done back in the water project review.

It wasn't as high on the agenda, so it didn't get the same mistreatment. There was this whole business about the ceiling on arms transfers. It turned out that the ceiling never limited anything because they had been very shrewd in the way they had set up the ceiling.

Except for 1978, the first year I was there, we didn't have to hold transfers down to keep from violating the ceiling. In 1978 I went to extraordinary lengths to make sure that we transferred as many arms as the ceiling allowed. We had to time everything so that we reached the ceiling.

You may say that was antithetical to the Carter policy. It really wasn't because everybody saw that we were trying to save Carter from himself. The next year we had Camp David. The truth of the matter is that once Carter got going, he transferred as many arms as anybody because he found, like his predecessors, that they were an essential tool of policy. In connection with the Camp David accords, Israel got \$2.2 billion in credits, plus \$800 million for the airfields, and Egypt got \$1.5 billion in credits. These were the biggest arms transfers we'd made except for the Yom Kippur War.

Q: There's a certain irony in that, of course.

A: Yes, and you know, nobody was up there telling Carter at Camp David, "Now, now, now—don't transfer any arms." So his administration went through a complete transformation on this point.

Q: You know, critics of military aid policies hit from a lot of directions, but one of the things they tend to emphasize is the willingness to help dictators, as long as they are anti-Communist.

A: This is a political issue, and the government has been more or less effective in deciding these things. The State Department, generally, if they have decided that a particular government is to be supported, then they want to supply them arms. There is an image that the Pentagon is pushing arms and the State Department is holding back.

The actuality is the opposite. The Pentagon generally is not pushing arms. If you are into an El Salvador situation where the Pentagon is charged with trying to win a war, then they are pushing arms. But if there aren't hostilities, the State Department is usually much more enthusiastic about arms sales than the Pentagon.

Q: That's a good point, and I guess the way the arrangement is, with a flag officer at DSAA, it perpetuates the appearance that it's a—

A: That's right. But you know, they have this guy there to deal with all the different people. He has all the foreign representatives to deal with. The President has his appointees deal at the political level, but they have to have somebody to deal at the bureaucratic level. There are many levels of interchange. But you have three top levels.

You have the political level. Then you have a level of the Chiefs of Staff and the chairman of the Joint Chiefs. There is a lot of liaison at that level. But then, when they want to get down to the nitty-gritty, who do they talk to? The Director of the Defense Security Assistance Agency. While the top guys go sightseeing, he does the work.

Q: You surprised me when you observed that you had always wanted to be Director of Civil Works and that you were very happy doing that. I would have thought that with your background and expertise in nuclear power, you would have found civil works frustrating and maybe a necessary evil.

A: Not really. Of course, I grew up on civil works as a boy. My father was involved in it. That was when they had the 1927 flood on the Mississippi River, my father participated in drafting the 1928 Flood Control Act, and they launched the major program for flood control on the Mississippi River.

With the Depression and the New Deal, there was a very strong motivation for public works. That's when the whole civil works program grew from a simple interest in navigation to a comprehensive water resource program. The principles which had been established in the 1928 act on the Mississippi River were extended nationwide in the Flood Control Act of 1936.

I watched all this as a boy and heard about it from my father. I was fascinated in the program. It's true that I became involved in nuclear energy, but my interest there was

more technical. The civil works program has a lot of technical problems, but it has a political dimension which had always fascinated my father and fascinated me, too.

At the time the program was moving forward vigorously, while there were many things to deal with, the people that were running it and carrying it out were succeeding in moving ahead.

It may not have been easy. But if you're succeeding, that is a reward. Now that we're in an era where there is much more environmental concern and much more budget stringency, and the development of the country is more mature, they're not able to do much.

There haven't been authorization acts. The funding is way down. There are not that many new starts. Perhaps the people that are trying to do it now aren't getting the same satisfaction that we got when we were able to go ahead and do things.

So I did enjoy the program. Perhaps there was a watershed between my initial period and the period when President Carter became president.

I started out in the fall of '75. So I had that period and all of '76. There were certainly frustrations because the Office of Management and Budget was resisting policy reform. We were trying not necessarily to change the policy in a way that would cause us to be allowed to have more projects, but to resolve a lot of policy issues about what you could and could not do, what the government would and would not pay for, in order to build the projects or not, to get authorization or not.

We were having difficulty doing this. But when President Carter came along with his water project review, we didn't get anything constructive done during that period. A lot of us thought that was 90 percent of the game. If the White House could put up enough flak, they would just stymie the program and this would accomplish the end of not allowing this work to go ahead.

I think that was a frustrating period. The way we handled the water project review gave most of the people involved in it a lot of satisfaction.

Q: I'll bet.

A: Don Duncan, for example, who was one of the main civilians at OCE that worked on it. Don had been on the staff of the Board of Engineers for Rivers and Harbors. But then he came up to the policy office in OCE. He was one of the principal guys that worked with me on the review.

We were able to handle that review and, I think, win grudging respect from the Carter administration people, to get through the review with the support of the people up in Congress for the way we handled it. Secretary of the Army Alexander was very impressed with the way the Corps dealt with that. That involved a lot of politics—the ability to perceive what the situation was and do the right thing. I've always been interested in that. My father was always interested in it and was a very skilled practitioner of these things.

So I think it was the combination of the technical challenges with management and political challenges. Over its life, the Corps had handled these three things very well. So it was a challenge. But it was very rewarding.

Q: I hadn't really realized when we started talking that your interests lay in that field.

A: It's perfectly true that I was fascinated by the nuclear energy business. That had a lot of technical challenges and I did get my degree in physics. But over time there got to be a lot of frustrations in that business. Actually, the nuclear business has suffered every bit as much of a stalemate, if you will, not so much because of technical challenges, but some of the management has not been that good and the political aspects have been handled very poorly.

It's hard to compare the two fields. I had a lot of good friends and a lot of people in both that I respected.

Q: Given your interest in civil works, did you find it frustrating to be kept out of it for so long?

A: You have to remember that that was the principal thing that I was doing when I was the division engineer in Chicago.

Up to that point, I had been involved in other things. When I went to the Pentagon from the War College into the Office of the Under Secretary of the Army to work on the Panama Canal, I had hoped to get a district. But General Wilson was adamant that I should go into the headquarters. I think his view was, since I had not been in the Pentagon up to that point and was completing 21 years of service, unless I went into the Pentagon and had the experience that you get there and had the exposure that you get there, I wouldn't advance in the Army. And he was right.

Q: One other thing you mentioned earlier, your description of military construction as messy and civil works as more organized.

A: I was referring to the fact that the Corps of Engineers was more autonomous in its role in civil works than in its role in military programs. In the civil works program, there was the Office of Management and Budget, the committees in Congress, but the Corps was responsible for making the feasibility studies, making the designs, doing the construction, and operating the projects. It had the whole life cycle in its hands, and it had a single organization. The Corps had a Director of Civil Works with his staff which handled all aspects of the program. The Chief had command over the divisions and districts. They worked directly with the Office of Management and Budget and with the committees of Congress.

When you get to the military program, a lot of the planning that the Corps did for civil works was done by the Pentagon. You had the Army staff. You had the OSD staff. So you had a much more complex hierarchy above you, and the military construction program for the Army was part of a larger military construction program involving the Navy and the Air Force as well. So the wiring diagram for the military construction program was a lot more complex.

It's evolved some since my first contact with it to the point that the Chief of Engineers has a more comprehensive role. It used to be, back in those days, that the Deputy Chief of Staff for Logistics had under him a director of installations. That was always an engineer officer, and he was responsible for the program. But he did not report to the Chief of Engineers. It was the Deputy Chief of Staff for Logistics who was responsible for the programming of the military construction program.

Now that's changed. That's changed to the point that the position became the Assistant Chief of Engineers. The job is now in the Pentagon. And the Assistant Chief of Engineers works for the Chief of Engineers, and it's his job to complete all the interactions with the Army staff and with OSD on the military construction programs.

So the organization has evolved to the point that the Chief of Engineers has a more comprehensive role. But if you go back to the time when I was the Deputy Chief, that was a fairly new situation.

Q: So it was messy in terms of the number of people, the number of agencies that were involved.

A: When you get to the projects themselves, it was a cleaner proposition. Building barracks and hospitals didn't involve all the community interactions of the civil works program.

Q: You were Deputy Chief under General Morris.

A: That's right.

Q: And I wonder if you would describe or give us some insight into how he operated, his approach to problems.

A: The first thing you have to recognize is that he was an extraordinarily innovative person. He also was very astute about people. His method of operation focused very much on the question of relations among people and the fact that it was key to get people's support. For that reason, he would approach problems from the point of view of what could be done differently from what was being done.

He wasn't one of these guys who believed, "If it ain't broke, don't fix it." He used to say that, but that isn't the way he operated.

Q: He fixed it a lot.

A: His approach to problems was always to look for a different way of doing things. He could be persuaded—and I often sought to persuade him—that a different way of doing things would not necessarily be better and that, unless you were convinced it was better, it was preferable not to put people through the drill of trying something new.

But his bias was the opposite of that. His bias was to try new things, see how they worked out. Then if they didn't work out, to try something else. This was his innovative nature.

Q: Kind of experimental.

A: Experimental. Now something that will never be proved one way or the other is whether the net benefit of this experimental approach outweighed the cost in effort. There is no way to sit down and say, "If we hadn't tried all these new things and had just plugged away, would we have been further along than having tried the new things?" There is no way to evaluate that cost. Different people have different personalities and different approaches.

There is absolutely no question that a lot of his innovative ideas were a very important contribution to the Corps of Engineers. I personally think, as far as the water project review is concerned, that the way he handled his relations with President Carter was an important factor in the Corps coming through that exercise as well as it did.

I give myself credit for handling the actual work of conducting the review. He gave me a completely free hand in that, counted on me to do it, left me to do it. He and I talked

it over a lot. But he never interfered with anything I proposed. He left that to me completely.

But he undertook to make contact with President Carter through talking to people. He did go and see President Carter in the White House. He worked up by himself a little presentation that he gave to Carter.

He and I worked together to an extent because he gave his ideas and I made suggestions. He went over and saw the President. The basic outcome of that was to dispel, to an extent at least, some animosity that Carter felt toward the Corps as a result of what the Corps did about one of the dams in Georgia.

When he was running for governor, Carter opposed the Spewrell Bluff Dam project on the grounds that it was not necessary and would be environmentally damaging. He was then elected governor, and there was a fight in the state legislature over this dam.

The Corps was asked by one of the proponents of the dam to help prepare legislation to deal with this issue in the state legislature of Georgia. The Corps did help. It became public knowledge that the Corps had helped draft this legislation, which basically was aimed at thwarting Carter. Carter was very upset and he went public on this thing. It was a very unpleasant situation.

The general view in the Corps was that Carter came away from this experience as governor of Georgia with considerable animosity towards the Corps and that this was a factor in the water project business because, if you will, Carter was determined to put the Corps in its place. I think that's probably true.

What Jack Morris did was to make contact with Carter. He went over to the White House and he told Carter that he had been the Director of Civil Works when this dam controversy had occurred. That probably President Carter and he were the two greatest experts on this problem. I think the way he handled this whole thing, which epitomizes my earlier statement that he was very sharp on what it takes to make contact with people and get through to them, helped the Corps a lot.

You know, they dealt with another government reorganization proposal in the Carter administration. I don't think the things that the Corps did about that were as important as what our friends up in Congress did.

I think that Morris's ability to handle all these political issues was outstanding. As a manager, his experimental approach to organization and to policy caused a lot of work. And there were changes in direction.

Whether you could have gotten to the solution you got to without this is certainly debatable. I used to try to persuade him that if we would spend a little more time thinking about how these things would come out, we wouldn't necessarily have to conduct the experiment because some of them were good and some of them I didn't believe were going to work.

I didn't think it was necessary to conduct the experiment. I thought if you thought about it, you'd know damn well it wouldn't work. But sometimes he agreed with me and we didn't do it, and sometimes he didn't agree with me and we did do it.

Q: But your approaches were really almost in diametric opposition.

A: I was much more prone to think about it and talk about it. As I mentioned earlier, my view was that if you thought about it long enough until you figured out what there was to do, and then you decided to do it and you did it, then you didn't turn around unless it was obviously a catastrophe. His view was that if you had a good idea, you would try it on a limited basis and see how it worked.

Q: What kind of a team did that make you?

A: It might have made a pretty strong team.

Q: I would think it might. I don't know if there is anything else I should ask you about that, or whether we ought to go to DSAA now.

A: I think we ought to go on.

Q: One of the things you already mentioned in talking about DSAA was the different interests of the State and the Defense Departments when it came to arms transfers. Would you clarify that.

A: Of course, arms transfers are an instrument of policy. Now more than ever—but it has been progressively this way—we have all these overseas interests that are vital. Our own fate is tied to the fate of our friends and allies overseas. We might wish that it weren't so but it is. If they do not flourish, we will not either.

But we have limited tools to deal with this. Right after World War II, we were very powerful and very strong, economically. We were in a very favorable position to deal with these overseas problems. Today, relatively speaking, we are much less powerful. And certainly our economic strength does not dominate the world economy as it did in the '50s. For that reason, policy instruments, such as military aid and economic aid, are very important tools in dealing with these overseas issues.

The State Department focuses most intensely on the political effects that could be achieved because their preoccupation is the decisions, the political decisions that are made by the leadership in friendly countries. I guess to put it another way, if a president or king or whatever in this other country decides that he's a friend of the United States, that's the most critical thing in terms of conducting diplomacy.

The Defense Department is more interested in our defense posture and perhaps tends to take for granted that these countries will be our allies. I don't mean that they don't concern themselves with the attitudes. But they figure that country X has been an ally of the United States for a long time. They see that that country's interests are aligned with ours. Therefore, if there is a conflict, we ought to be able to count on the cooperation of that country.

So the DOD is more interested in the mechanics: what is the quality of the armed forces in these countries, what bases have we got? In other words, how, physically, do you get yourself in a stronger posture?

The State Department tends to take for granted that that can be done anytime. The important thing is to be sure that you have the politics lined up right.

This spills over into the practicalities of it because the Defense Department is trying to design an efficient program. The State Department is trying to be sure that the foreign government is happy with the program. They're not always so concerned about whether it's efficient or not, as long as the foreign government is content with it.

When the Defense Department says we shouldn't supply them these weapons because the state of training and sophistication there is such that they'll never make any use of this stuff, it will just sit around or be broken, the State Department tends to take the attitude, "That's not all that important. If they want it, let's give it to them and then we can count on them to conduct themselves in a way that will serve our mutual interests."

Q: That creates cases in which the State Department becomes the advocate of transfers.

A: Very often, or most often, the State Department has been more positive on the program than the Defense Department because they see it as a response, a political response, in the relationship. Whereas the Defense Department thinks, "Why are we spending hundreds of millions of dollars on this stuff when we should be trying to get the most defense for our money?"

Q: So what does that do to relations?

A: I think the relations are pretty good, although occasionally there are problems. There are a lot of times when the State Department ends up going ahead. The Secretary of State is the principal foreign policy adviser to the President. All the laws regarding foreign assistance make it a State Department program. So the Secretary of State and his department have the deciding voice in most of these matters. Defense may not want to do this, that or the other thing.

For example, there was a great issue over supplying F-16 fighters to Pakistan. Of course, the Carter administration had refused to even consider this and had offered A-7s and F-5s. But the position of the [General Mohammad] Zia [ul Haq] government was that these planes weren't good enough for the Pakistan Air Force, and that it was not worth the risks of accepting U.S. aid for planes that were no more capable than these older planes.

When the Reagan administration came to office, former Senator [James] Buckley, who became the Under Secretary of State for Security Assistance, pressed very hard to supply F-16 aircraft to Pakistan to respond politically to Zia's requests.

The Defense Department's attitude was that they could not disrupt the delivery of F-16 aircraft to the United States Air Force and our NATO allies to provide for Pakistan. They could build planes for Pakistan, but it would take two-and-a-half years to deliver them.

Buckley never really accepted that. He just kept working away at the problem until he finally got a commitment to supply six F-16s to Pakistan in a year. They worked this out to take some deliveries that were destined for Europe, so I think that the Defense Department saved face.

But the point is, the Defense Department was more concerned about preserving the integrity of the U.S. F-16 program than it was about delivering the assistance to Pakistan. The focus at the State Department was that, compared to reestablishing the relationship with Pakistan, the impact of diverting aircraft from our Air Force to theirs wasn't a very important consideration. That kind of thing was repeated every week for a different country.

Q: With different circumstances.

A: Different, but diversions were a big pain in the Pentagon. The State Department never got excited about them at all.

Q: You went to DSAA just as Iranian purchases were approaching zero. Or maybe they had already hit zero.

A: Later. When I went there on March 1, 1978, things were still on an up trend. In fact, the program was still going strong. The backlog of undelivered orders was about \$19 billion, and it was still growing, although it peaked out because the sales of the Navy ships, the sales of the F-16 aircraft, the sales of the AWACS [Airborne Warning and Control System], all had been concluded.

At the time I arrived, of course, the Carter administration, with its policy that these arms transfers would be only an exceptional tool, was trying to throttle back.

I know one of the things that the Shah asked for was F-4 Wild Weasel aircraft. The F-4 aircraft was equipped with a lot of electronic gear that could be used to spoof enemy air defenses. There was a big argument about whether or not to sell these aircraft to Iran.

In the end, they persuaded Iran to withdraw the request. I made a trip to Iran in April of '78, and things were in pretty good shape then. I went again with Deputy Secretary Duncan, in the fall. We were in Iran in October, and they were starting to have real troubles. They were having riots.

Q: Did you see them yourself, by the way?

A: We were in Isfahan and got sort of trapped in the hotel, not in a serious way. But there was a disturbance. We were supposed to go out to the base and have dinner at the helicopter school. We had to delay our departure from the hotel because they didn't want to risk getting our little convoy of cars tied up in this demonstration. Things were definitely getting tense then, although, of course, the Shah was still in his office. He had not yet abdicated.

As things got worse and as the Shah withdrew and the Bakhtiar government took control, things began deteriorating. Right after the first of the year, we couldn't get any money from them. The reason we couldn't was that the employees in the Iranian Central Bank had refused to write the checks. Even though the Bakhtiar government said, "Pay," they refused to write the checks.

We were spending money on the Iranian program at about the rate of \$250 million a month at that time. And we had a balance on the 10th of January of \$700 million. Normally, the payments were made quarterly. Basically, what they had done was to default on the quarterly payment that would have covered the next three months.

On the quarterly cycle we didn't stand to get any more money until the end of March. It really wasn't clear when. Our money was going to be exhausted in less than three months. That was a pretty tough situation. The U.S. government would have been in

default on all these contracts because the contracts were between the U.S. government and the suppliers. But the only legal source of money for the program payments was the money from Iran.

What we did was to go to work to get new purchasers. Israel had wanted earlier delivery of its F-16s. So they took the first F-16s. Iran had been ahead of Israel in the queue. What we did was to have Israel take over the Iranian F-16s.

But the biggest thing that occurred concerned the four ships being built for Iran—cruisers or destroyers, the same size ship as the present Aegis ship. Not the same cost, but basically the same hull. They were being built in a shipyard in Pascagoula, Mississippi.

We asked the U.S. Navy whether it was interested in taking these ships. The U.S. Navy wanted the ships, but the whole business of rearranging the Navy program to factor in these ships, worth about \$150 million apiece, was very difficult. Senator Stennis was very interested in it because the shipyard was in his state.

We managed to get authorization and appropriations for the U.S. Navy to take over the four ships by about July. The Iranian program never went in the red. The balance got down to about \$100 million. It got to the point that if we did not get this ship money in July, we were going to be broke. But we got it.

Q: Didn't you go to the Middle East with Harold Brown as a result of this?

A: The trip with Brown was completely different. In conjunction with Camp David, we had a large program involving Israel and Egypt. Brown made a trip that included Saudi Arabia, Jordan, Israel, and Egypt. I went on that trip with him. This was after the Camp David "framework" negotiations in August of 1978 and before the final treaty negotiations in Washington in March of 1979.

Q: Was that February of '79?

A: February of '79. I mentioned that arms sales were an instrument of policy. There was a lot of discussion about strategy on this trip. But what these countries were interested in was what the U.S. would agree to in the way of arms sales.

I had an interesting experience. We flew straight over there. That's a long flight. We stayed up all night, redoing Brown's talking papers. We left from Washington in the evening, and we got there at about five in the afternoon the next day.

This, of course, was an Air Force special-mission plane, Brown's own plane. We stopped at Torrejon [Air Force Base] near Madrid in Spain, just a fuel stop on the ground for a couple of hours. We got to Riyadh about supper time. The Saudis immediately wanted to have a meeting. I had to meet with the Saudis over what was going to happen the next day. That meeting lasted three or four hours.

I did get a little sleep. Then the next day we went through the whole thing again with Brown. There was a long litany of turn downs of things the Saudis wanted. It was pretty tough. Knowing what I know now, I think I could have handled it better than I did then. At the time, I'd been on the job about a year. I was in the job for about three and a half years. I learned more about the way these things worked.

There were a lot of bruised feelings over the unwillingness of the United States to agree to these sales. Carter did not want to supply all these weapons. And there was another big problem with Saudi Arabia. Israel objected to sales to Saudi Arabia, and whenever they were sent up to Congress, it caused a big brouhaha over whether or not the Saudis should receive them.

The Carter administration didn't want to agree to sell weapons to Saudi Arabia and then get into the kind of fight that occurred, for example, when the Reagan administration tried to sell the AWACS and did, in the end, sell the AWACS. That was a very tough fight. That was one of the reasons that the Carter administration stood off from supplying everything that the Saudis asked for.

Q: You went to Jordan and Saudi Arabia and Egypt and Israel?

A: We went first to Saudi Arabia. Then we stopped over in Jordan. That was a brief trip, but a very interesting trip because we went to dinner with King Hussein in his palace. Again, there were talks about arms.

Then we took off and flew towards Cyprus, then turned and flew toward Athens, then flew back to Israel. You couldn't fly directly from Jordan to Israel because of the airspace problem. The Israelis really rolled out the red carpet for us. Ezer Weizman was the Minister of Defense of Israel at that time. And he and Brown were quite compatible.

Q: He was kind of a charismatic figure, wasn't he?

A: Very. Weizman was very charismatic. But he knew how to conduct himself with Brown. And Brown had a great deal of respect for him.

They gave excellent briefings on what they were doing and wanted to do. Of course, they wanted aircraft and other weapons.

The purpose of all this was to lay the groundwork for agreements to deliver all of the arms, to be concluded in conjunction with agreement on peace between Egypt and Israel. These earlier discussions exposed the kinds of arms transfers and other military assistance that Israel and Egypt were looking for, without agreeing prematurely to the things that they were asking for.

When Israel and Egypt agreed on the final terms of the peace in Washington, the United States was able to say, “This is the response that we can make to your requests.” And that response was to provide \$1.5 billion in credits to Egypt for it to start a modernization program, a replacement of its Soviet weapons inventory with a U.S. inventory. And to Israel, guaranteed loans of about \$2.2 billion to finance the move out of the Sinai, plus the \$800 million for the airfields.

Q: Is there sort of an underlying irony or something? You are handling negotiations with countries that had recently been enemies in one trip, and countries that could again be enemies at any time. I’m sure everybody understood that.

A: That’s one of the fascinating aspects of the politics of it. I think that the leadership in the United States and the leadership in Israel were convinced that Sadat had turned Egypt around and that the Egyptians were most unlikely ever to turn back. Egypt had had its years—and they were years—of hostility. Its alliance with the Soviet Union was not working. Therefore, they were going to move into the western camp.

There was a big negative in this because when Sadat went to Jerusalem and when he made peace with Israel, he lost very large amounts of financial support that he was getting from the wealthier Arab states. It’s very hard to say from an economic point of view what the net effect was. I’m sure that will be debated over time.

The Sadat regime was, and the Mubarak regime that succeeded it apparently is, committed to the proposition that in the long run they will be better off. But I guess people aren’t under any illusion that this peace could go sour.

In all the subsequent aid bills that have gone to Congress, you find the supporters of Israel also the strongest supporters of aid to Egypt because they feel that so long as we have an adequate aid program, that will diminish the temptation for the Egyptians to move away from what they’ve agreed.

Q: When you were in the Middle East that time, was there knowledge that such an agreement was pending—I suppose the Saudis and the Jordanians saw it coming—or did they see it coming? Could you tell that they saw it coming?

A: I think they probably did see it coming. But I don't remember, and I sat in on most of the discussions. In fact, I had to take notes on several of them. Although I did not sit in on the discussions with King Hussein, I did sit in on some of the discussions in Saudi Arabia, particularly the ones between Brown and Prince Sultan, the Saudi Minister of Defense and Aviation.

In the Saudi discussions, there was some allusion to the relations with Israel. But the preoccupation was more on military cooperation between Saudi Arabia and the United States. I don't know about Hussein. I think that we were always trying to persuade them that if they would accept Israel into the family of nations, we would have a much better chance of influencing Israel's behavior. The policy of confrontation with Israel weakened the chances of the United States to moderate Israeli behavior. But countries like Saudi Arabia were so vehement in their opposition to Israel that it was very hard to make any progress with them on any of this.

Q: You've mentioned President Carter trying to make arms transfer the exception rather than the rule. But quantitatively did that really work out?

A: It didn't work at all. It was an unsound proposition from the word go.

Q: And he never could implement it, either, could he?

A: He had a ceiling the first year. I was the one that had to administer the program during that first year of the ceiling. Howard Fish, my predecessor, had been there when it was first established. But the ceiling was a fiscal year ceiling. And the first year that the ceiling was to apply was from October of '77 through September of '78.

This policy was not one that had been particularly advocated in the Department of Defense. But interestingly enough, the political leadership in the Department of Defense did not want to be perceived by the State Department and the National Security Council [NSC] staff as dragging its feet.

Therefore, my political superiors in the Pentagon were very careful not to take actions that appeared to undercut the President's policy. But Howie Fish, who was very knowledgeable in this, had helped to set up the ceiling so that it wasn't going to really pinch that much. The way he'd done that was to make all kinds of arguments about the size of the program. The arithmetic came out in such a way that the final amount agreed on for the ceiling, which was \$8.6 billion, was not a very restrictive program.

It did have one impact. It was a factor in discouraging Iran from ordering more big ships. Iran had an idea of going on to another class of ship. The U.S. was resisting this. They told the Shah that just wasn't consistent with the U.S. policy of arms restraint.

The Shah couldn't afford the ships, anyway. I don't know how that all would have come out. But the only place that I saw that the ceiling ever had any possible effect was in this Iranian ship sale.

Just to finish up this subject, actually, what I did—I don't remember that I ever got any explicit instructions, but it was the way I viewed my mission—was to make absolutely certain that we spent the ceiling.

The reason for that was that the Defense Department was very concerned that if we failed to spend as much as the ceiling allowed, the amount by which we underran would be subtracted from the ceiling for the succeeding year. They could see a squeeze going on. They felt strongly that we needed the ability to make these sales in order to pursue U.S. policy.

Everybody in the Pentagon thought from the word go we were going to need it. Then Camp David came along and the thing was thrown in the ash can. It was not thrown in the ash can physically because the ceiling remained on the books. But they stopped making speeches about it and talking about it. By the time you get into 1980, the Carter administration was using arms transfers to pursue its foreign policy as much as any government that we've ever had.

Q: So they learned?

A: Yes.

Q: They never said they learned, but they did?

A: They never said they learned. Carter may have felt in his heart that it was still wrong. But he did what he had to do.

Q: What is the role of the defense firms themselves? Do they play a role in generating foreign demand?

A: They certainly do. And that was one of the controversial aspects of the Carter policy. Under the Carter policy, they had what was called the "leprosy letter." This letter was a letter that was sent to all the ambassadors giving guidance on restricting contractor activity that might lead to arms sales, and specifically the embassy was not to do anything on behalf of a contractor who was there for the purpose of selling arms.

They were not to help him arrange appointments or provide any other courtesies if his purpose was selling arms. This upset everybody, including some of the embassies because the embassies perceived that the trade in arms was important as a political

signal in the relations with these foreign governments. They felt that if the U.S. declined to help conduct this business, it would be seen as a hostile act by the foreign government, which in some cases it was. But that letter remained on the books. It remained on the books until it was removed by the Reagan administration.

Q: Did the arms suppliers make any efforts to get around this? I mean, did it essentially stop their efforts?

A: Let me mention one other provision that was in effect. That was that they required either a license or an advisory opinion from the Office of Munitions Control in the Department of State before they could undertake marketing of any weapon that was on the munitions list. The Carter administration manipulated that requirement to try to constrain the contractors.

So the combination of the “leprosy letter” and the strictures under the munitions list caused the contractors a lot of grief and, I think, did have some restraint.

The attitude of the Department of Defense on this varied. There were two schools of thought in the Defense Department. There were some areas in the Defense Department where the foreign sales of a particular weapons system were viewed positively.

Q: To keep an assembly line moving, for example.

A: To maintain a hot or warm production line because relations with foreign governments were important. I think the Air Force, in particular, is in that role because they have to operate worldwide, and their relations with the air forces of allied and friendly governments are critical to their operations. So they are of a frame of mind and they are structured to conduct the matter of military aid and sales of arms—Air Force weapons systems. It’s a part of their main mission almost.

The Navy is the exact opposite, for the most part. Although they are interested in cooperation with other navies, it doesn’t dominate the scene. And the Army’s kind of halfway between.

The two positions of the services on this would be quite different. There were some who didn’t like the idea of the contractors being restricted. I think there were just as many that were delighted because they thought that these marketing activities by the contractors were often the source of a lot of trouble.

Q: They would skew the process, wouldn’t they?

A: There were two things that this did. If you were in the early stages of a program and you got a lot of foreign demand, then you put a burden on the U.S. procurement process.

The most glaring case of this I can remember was the new M-198 howitzer. The production rate that the Army had arranged for this howitzer was not all that rapid. And it was going to take two, three, maybe four years to deliver to just the high-priority units, like the 82d Airborne and one of the Marine divisions that were getting this equipment.

When the foreign governments started trooping in with requests to buy the M-198 howitzer, that caused all kinds of complexities. That caused this diversion syndrome that I mentioned earlier. The Army just had fits with all these requests for foreign delivery of howitzers.

I had fits because I was caught between the Army's reluctance to divert these things and the insistence of the foreign governments that they wanted them. It was my job to sort this out and make a recommendation. It wasn't up to me to make the decision. The Secretary of Defense made that. But I had to conduct all the negotiations and tell each side that they should be more cooperative and so forth. These things were interminable.

Because I got put through the wringer like this, generally I wasn't that enthusiastic about the knowledge that some contractor had just set out to sell something to somebody. That was somewhat different from some of my predecessors who saw themselves as people who should pursue these sales. I don't mean that they hoped that the sales this year would be higher than they'd ever been.

A prominent example of the motivation of the service to sell weapons systems to foreign governments occurred with the AWACS, the Boeing E3A, because earlier the program had been projected to be much larger. Then there was cost growth and a series of things, and the program came out a certain size. If you looked at the way Boeing had been planning things, there were a lot of extra planes. So there was interest in foreign sales.

Iran contracted to buy some. The NATO AWACS program was another way to take care of the problem. We needed the capability in Europe. But there was a big push by Boeing—and I think probably the program people in the Air Force—to get more sales of the Boeing AWACS, to distribute the overhead, and so forth. That was successful. This illustrates the two viewpoints.

My bosses in the Carter administration generally professed that they opposed all these sales.

Q: And I guess you were opposed to the—

A: I was mixed. Some of them I felt were a good idea; and some they opposed I thought were a good idea, but they opposed them anyway because they had this sort of ideological thing. Others that were being pushed, it was the other way around. For example, later on in the Reagan administration, when the Air Force was pushing to sell the F-16 to Venezuela, I thought that was a mistake. It was over \$500 million, and I didn't think the Venezuelans really needed the planes. But that one went ahead for a combination of reasons.

Sometimes I was very sympathetic to the requirements of the foreign government. Other times I wasn't. I didn't have a bias on it.

Q: You mentioned negotiations, especially in the context of cases where arms firms had created or encouraged demand.

A: There was always a big problem over price because the contractor would quote the price without any support. They'd always fuzz the issue. If they mentioned support, it would always be a fraction of what was needed. Then we had the job of persuading the foreign government to buy enough support and explaining why it was that our estimates were different from the contractors. Then, if it was a grant or concessionary loan, we had to come up with the money through the budget process.

Q: What about the negotiating process itself? What is required to conduct successful negotiations on an issue like this?

A: Preparations first. You have to spend a lot of time getting your paper right. It makes a great deal of difference what you put on the table. It's very easy to lose a lot of points by putting things on the table that aren't defensible.

You have to visualize the way this document is likely to undergo change as it's discussed. If there is some requirement that you have, you'd better have it in there at the beginning, because if you have 20 requirements and you have them all in there, and the other guy has his 20 in his draft, and then you start seeing if you can compromise, it's extremely expensive in negotiating capital to have to introduce something later on.

Q: You certainly never say, "Oh, I forgot, but I need—"

A: Sometimes you do find big holes. But when you do that, you figure that in terms of the psychology of it, he's going to make a big fuss that you're just making things worse instead of better. Then, in order to get a tradeoff, you may have to concede things you don't want to concede.

Q: You have to know what you are willing to give away?

A: Yes, although I always went into negotiations with the idea that I wouldn't give anything until I was absolutely driven. Perhaps not always. That's a little harsh.

But there are two theories. One is to load the agreement up with a lot of stuff that isn't really needed, and then be willing to give a lot of it away. The other is to boil it down before you go in so that it doesn't appear as onerous to the other side. Under the second approach, you have to be tougher on holding the line. If you had stripped away all the things you might ultimately be willing to give away and made that your initial presentation, you didn't have as much flexibility.

Q: Who were the hardest negotiators?

A: The ones that I had the most trouble with were the Arabs. But that, I think, was because I didn't fully understand the way they approached negotiations. There was a cultural difference.

I mentioned the fact that when I made that trip with Harold Brown, they kept me up half the night. I think a westerner or a western country would not do that because they would feel that it was not courteous to take somebody right off a plane and put him through a drill like that.

The Saudis have a lot of manners in some respects. They can be very polite. But this business of putting heat on the guy you're negotiating with is SOP [standard operating procedure] for them.

It appears to me that in the Arab culture, it's an accepted form of dialogue, when you're negotiating with somebody, and it's not considered rude or inconsiderate to make life awkward for the other guy.

[Major General Richard M.] Dick Wells, whom you may have run into when he was Deputy Chief of Engineers, used to tell the story about his negotiations with the Saudis when they wanted him to agree to award a contract to some relative of theirs for food service. He did not believe that it was the right way to do it. As far as he was concerned, they had hired the Corps of Engineers to come over there to Saudi Arabia to award contracts in accordance with the practices of the Corps of Engineers, and not to become engaged in the sort of favoritism that was practiced in Saudi Arabia on their own contracts.

Dick said that they plunked him in a chair in the afternoon, facing out a west window, hammered at him for an hour and a half about this. I don't think he gave up on it right

away. He resisted this technique. But in their culture, that's a perfectly accepted way to go about things.

Q: Just to go off briefly on this tangent of General Wells and the food service contract, why not give it up straight away?

A: The Corps' concept was that there were certain standards that you observe in conducting your business by contract. The Corps has built these standards over time. The Saudis had wanted to get the management technique of the Corps to run their program to save money and to get it done efficiently, on time, and at a good quality. The Corps was not over there to act like the engineering department of the Saudi Ministry of Defense and Aviation.

We were not hiring the Corps people out as mercenaries to do the bidding of the Saudis. We had a sales relationship where the Saudis said, "We want to build a building, and we will contract with the U.S. government to have that building built under the auspices of the Corps of Engineers."

The Saudis certainly would have everything to say about the design of the building—whether it was blue or pink and all that. That's not the issue. But when it came to managing the way the work was done, the Corps' view was that they were hired to manage it in a way they knew. If the Saudis wanted to manage it their way, they didn't have to have the Corps. They could get somebody else to manage.

This attitude has been the way the Corps has always felt, that they did not want to become engaged in political manipulation or influence or anything. They did not want to be party to that and should not be.

Q: I just wondered if some wouldn't in that particular case, say, "Well, fair enough. We manage construction and you do your food service without—"

A: The truth of the matter is that then, and later, the Corps conceded to the Saudis quite a few of these special requests. The situation evolved from the early days when the Corps had absolute authority to one where the Corps accommodated the Saudis. After all, the money was from Saudi Arabia, so it wasn't as if the U.S. taxpayers were being taken by these practices. The Corps' position on this softened.

Q: Yes. I could imagine a guy like General Wells just not wanting to sit and face the western sun every afternoon.

A: Yes, but I think the attitude of Wells and of [Major General James N.] Jim Ellis who took his place and [Major General] George [R.] Robertson who followed him—the

attitude of these people was that the Corps has certain standards of integrity and performance, and it was not going to compromise them just because it was over in some foreign country.

Q: I've got a lot of questions regarding the Israeli air base program and your role in that. As you know, I have a special interest in that.

A: I realize that.

Q: But I wondered before I get into that whether it's fair to concentrate there, whether there were any other programs of major consequence that we ought to discuss first.

A: I just want to elaborate a little bit more on the relationship with Egypt because this was quite different. Of course, we'll never know, but when we first sat down to discuss this whole affair with Egypt, Egypt approached us, as we believe they probably approached the Soviet Union. They wanted us to provide them a lot of weapons, and they were very impatient when we told them that they had a ceiling of \$1.5 billion, and that everything had to fit into that ceiling. We went through several repeats of the way in which, if you have a certain amount of money, you lay out the acquisition program.

At first, they couldn't believe it. But I spent hours and hours working with the Egyptians on developing their program. I had occasion recently to look at the way in which they're planning, and the sort of approach that we started back there in the winter and spring of '79 is still being used.

The Egyptians have become very expert at the multi-year programming that's required. If you're acquiring—as they did—twenty F-16 aircraft and the deliveries are going to take place over a three-and-a-half-year period, then you have to be looking at how much money is going to be used each year. You have to program the whole thing. They were unfamiliar with this, or at least gave the appearance of being unfamiliar. They learned from sitting around the table with us how to do this.

Q: Is that a case where they may not be sufficiently sophisticated in their air force to handle such an airplane?

A: Well, I think their air force has a way to go. But it's not necessarily just sophistication, although that may be a problem. But there's a whole work ethic problem.

These American weapons systems are predicated on the proposition that you've got pilots and crew chiefs and maintenance people that are willing to work hard on these technical problems. We didn't encounter a lot of that among the Egyptians at the beginning. In a lot of cases, the Egyptians appeared not to want to work at it. So they

had a lot of trouble with the F-4s that we supplied because that was a very maintenance-intensive aircraft. They just didn't have the people that were used to this type of work.

Q: Is it conceivable, or does it happen, that we supply sophisticated weapons systems to a society like that, then the weapons systems fails them, and we get blamed for it?

A: We get blamed no matter what happens. It was very interesting in the case of Egypt. They were not coming up with enough people, and the people they came up with were not working long enough hours. And they weren't making progress on setting up their parts supply and their maintenance system.

I used to have meetings with General Abu Ghazala, who is now Minister of Defense of Egypt, when he was the attaché here. He and I used to have meetings about what needed to be done.

But on their part—I think their culture is like this—they never came to a meeting without a litany of things that we had not done, that we should have done. That's just their way of putting everybody on his guard.

Q: Making you face the sun.

A: We delivered the fins without the rockets, or it may have been that we delivered the rockets without the fins. They couldn't even fly the airplanes at that stage, so the fact that some of these rockets had been shipped over there without the fins was of some concern, but had no effect on their operational capability at all.

But they always had their list of things that weren't right. I learned to say, "Fine." I would try to get in advance from my action officer what they were going to complain about, and often we would get the list. So when they'd go down their list, I'd say "All right," and then I'd go down it and I would say, "Is there anything more to add on this one?"

But this gets back to my point that I think the Arab culture is different from ours. I'm not an expert on this. But just watching these negotiations, I saw that they were coming at the problem differently from what I would have as a westerner.

Israeli Air Base Program, 1981

Q: General Graves, Secretary Brown first offered military aid to the Israelis in the fall of 1978 during the Camp David negotiations. Were you involved in discussions of that before he made that offer?

A: I don't remember that I did anything more than help them cost out some things. In the case of aid to Israel, usually Israel would come up with some program that they wanted to pursue.

There was a good relationship between Brown and Ezer Weizman, who was then the Minister of Defense of Israel. Weizman would have these briefings, and I attended most of them, in which he would describe Israel's defense plans, and their programs, and the aircraft and the tanks and other weapons that they needed to fill out their force structure.

The briefings would include the rationale when they wanted more advanced weapons such as the AIM-9L, which was then the latest version of the Sidewinder missile. I was involved with helping put these papers together as to what the program would cost and what delivery dates we could undertake.

I almost never sat in on the nitty-gritty. Maybe once or twice I did when Brown would tell Weizman what he could and couldn't do. Usually they had discussed that in private beforehand because neither side wanted, if you will, to have an awkwardness in a meeting with a lot of people there.

So it wasn't all that big a meeting, but if Brown was going to tell Weizman he couldn't give him something, he usually had let him know in advance. Although I was there a couple of times when he first told Weizman what we could and couldn't do.

Q: That seemed to be a critical thing in the negotiations, the offer of that aid.

A: I don't think there is any question about it, that the offer of aid to both Israel and Egypt was a major inducement in the Camp David process.

I think that was the turnaround in the Carter administration as far as security assistance was concerned. They had come in with a very strong bias against military assistance. A number of people felt strongly about this—for example, Jessica Tuchman, who was the daughter of the famous historian Barbara Tuchman and was a member of the Carter administration. She served on the National Security Council staff.

She was one of the leaders in formulating the Carter policy which was announced on May 19, 1977, that the transfer of arms would be considered an exceptional tool of foreign policy and would be used only in exceptional circumstances. The policy paper propounded a whole series of restrictions on the transfer of arms.

They pursued that pretty hard at the beginning of the administration as we may have discussed earlier. But when it came to the Camp David negotiation, it became clear, and I am sure people like [Cyrus] Vance, probably [Zbigniew] Brzezinski, Brown, made it clear to President Carter what he was up against. Of course, the President was intimately involved in the negotiations himself.

He made his trip to the Middle East, conducted the Camp David talks himself. He was smart enough to see that this was really the *quid pro quo* in terms of U.S. assistance—to make each of these countries feel the security, not only the physical security of the additional arms, but the symbolic and psychological security of the tie to the United States. If Israel felt that it could count on U.S. arms and Egypt felt that it could count on U.S. arms, then the uncertainties of this peace arrangement were diminished for them.

It's a classic example of the way in which military aid is an important factor in our relations with other governments and has political implications far beyond any increment of military capability. Once the Carter administration had done this, used the aid in this way, they began to see that that was the way to get things done, and it tended to spill over into their relations all over the world.

Q: Forced them to look at and modify their initial—

A: Interestingly enough, they never modified any of their pronouncements. They just stopped talking about them.

Q: They just modified their practice, is that what it comes to?

A: When there were press or other media inquiries about what was going on, they would duck it. The policy enunciated in 1977 was still on the books when the Reagan administration came into office. I immediately started urging the people of the new administration to change this. That wasn't their highest priority and they didn't get around to it until the summer.

Q: Secretary Brown did make this offer in September or October of 1978, and when did DSAA start to get involved in it?

A: I think that we were involved before that, but when Brown made that trip in January–February of 1979 I went on the trip with him, and we worked on it.

During the first work on the airfield study with [Brigadier General] Paul [T.] Hartung and some others, I was involved not exactly as Director of DSAA, but because I was an engineer officer, and David McGiffert wanted me to tell him whether they had it right or not.

I knew what they were up to and I read some of the stuff they produced. I also thought about the mechanics of this and talked to McGiffert about how the whole thing might be done. At that stage, of course, they were looking at quite a few different sites, trying to see what they would cost, and also what the impact was going to be on the time required to relocate the fighter squadrons.

The site that the Israelis liked best, if I remember correctly, was one where it was going to take more time to develop the site fully. The site had more ultimate potential in terms of space for dispersal of aircraft and so forth. But the topography was such that it was going to take longer to develop all this. That site was later not picked, although the Israelis have gone ahead and developed that field on their own.

Q: That's usually called the third air base site. That's where all the Bedouin land problems—

A: The Bedouin land was one of the big problems there.

Q: You led a negotiating team over there in March of '79. Of course, by that time, it was pretty much decided that the U.S. government was going to provide two bases.

A: That's correct. The basic agreement to do this had been reached at Camp David. The amount of money had been set—that we would grant \$800 million.

The concept had been proposed by Weizman and agreed to. It would be conducted as an offshore operation, isolated from the Israeli economy to the maximum extent possible because, at the time of Camp David, the Israeli economy was humming along pretty well and the demand for everything was near the limits of the economy.

They were very concerned that a project of this size, superimposed on top of the construction industry, as it was then engaged, would have a very heavy inflationary effect, and also would run into all kinds of shortages which would delay it. When I went over, the object was to make an agreement which would establish this offshore regime. Up to that point, the leader of the activities had been Paul Hartung. My involvement in

the negotiation came along fairly late. I don't think that I knew that I was going until a week or two before we left.

Q: Is that right? You had a lot to catch up on, I suppose?

A: I had read some of the reports. I don't have a clear recollection of how that came about. But I think McGiffert finally decided that I should head up this team. Paul Hartung was a little disappointed in that, but he was a gentleman about it. We got a team from OCE. Of course, [Frederick B.] Fred McNeely went. Nancy Saunders went as the secretary and did a great job. We got some lawyers. We got an Air Force lawyer. We also got an OSD lawyer to help us to get the treaty negotiations.

Q: You had Colonel Haywood Hansell along, as I remember, who had been with this Middle East Task Group in ISA [Office of the Assistant Secretary of Defense for International Security Affairs]. Do you remember him? I just ask that because I'm curious about that Middle East Task Group. It seemed to have been kind of an ad hoc nucleus that did a lot of the early assembling of data and coordination of that. Do you remember that?

A: The Middle East Task Group was a mechanism that was used to try to cut through the normal bureaucratic structure to get quick action.

Q: So it was kind of an ad hoc organization just for this?

A: It was an ad hoc organization that had gone on. They'd turn it on and off. If they had something they wanted to do in a hurry for Israel or for Saudi Arabia or another country, they would turn this group on. When they said that it would handle it, in theory they could then talk to everybody directly, then present their paper to McGiffert. They didn't have to spend as much time coordinating and getting all the bosses to sign off on it. It was a mixed blessing. Sometimes it was good. Sometimes it was responsible for some hurried and not necessarily well-thought through schemes. But in ISA, you had the regional groups.

Q: That was [Deputy Assistant Secretary of Defense for Near Eastern, African, and South Asian Affairs Robert J.] Murray, in this case?

A: Bob Murray in this case. Then you had the functional groups. There was a policy group, which was a functional group, and there was DSAA, which was a functional group for managing arms sales. Another functional group worked on base rights agreements and that type of thing.

McGiffert really had two sets of groups, the regional people and the functional people. It wasn't always decided in advance which of these two groups would have the lead. Whichever group had the lead, the other group supported them.

Typically, when they were making policy, the regional groups would have the lead and the other people would provide them support in terms of what was practical. When they had decided on what they were going to do, typically the action would be transferred to one of the functional groups to carry it out. Then the regional group would monitor progress. If there were political consequences from this, they would offer their views as to what should and shouldn't be done.

For example, suppose we ran into some practical problem and couldn't deliver on what had been agreed. Then you would have to get the regional group back in to figure out how to change things. Having agreed with one of the foreign governments to do a certain thing for a certain price at a certain time, if you ran into difficulties and weren't able to do this, then the regional group was concerned about what that would do to our relations with the recipient.

The airfield project was handed off. In the early days, when it came to making the studies in the fall of '78, the regional group had the action. They were the ones with whom Paul Hartung and his team worked.

Then about the time we came to negotiate this agreement for building the airfields, McGiffert wanted to get me into it because he wanted somebody that had some experience in building things. That's the reason he brought me in.

Q: At that point, you had more than experience in building things. You had experience with the Israelis as well.

A: I was the best qualified guy that McGiffert had to work on this because I had done a lot of negotiations of this type. I had done construction negotiation work before. I knew quite a bit about airfields from my time in the NATO airfield program in SHAPE. I knew a lot about airfields from that. Some of that was out of date. But most of it was not. So I knew three sides of this program: the technical airfield side, the construction management side, and the relationship with Israel side.

Q: What's it like negotiating with the Israelis?

A: They're quite gentlemanly about negotiation. But the Israelis pursue a better deal vigorously. And they did in this case. However, apparently Weizman didn't want this held up a long time over details. The offshore concept was Weizman's concept.

In the Ministry of Defense there were people that normally handled this type of work who didn't like the idea that the Americans were going to run this job. They consisted of two types. One was the operational people who were concerned that, if we ran the job, we wouldn't build the field as they would wish it to be, that the configuration wouldn't meet all their needs. The other was the construction management people—the counterpart of the Army Corps of Engineers—who wanted to build things and didn't like the idea that they weren't going to be in charge of this.

Paul Hartung, who anticipated being the project manager, was very concerned that he would not have adequate authority, that in these negotiations we would concede too much of a say about details to the Israelis. But I told him he didn't have to worry about that. We hammered out some very tough language in that agreement that gave the United States pretty much the final say.

There were some words about operational requirements. But we provided for an appeal procedure up to the level of Weizman and McGiffert, which was never used.

One of the things we wrote in, that was never fully implemented as it was conceived, was a procedure whereby the Israelis would come up with the requirement. The Americans would sign off on this and cost it. Then, whenever there was a change, they both had to agree to the change.

The rationale behind this was very simple. If they once got the requirement for the field signed off and every change had to be agreed on, then all the Americans had to do was to refuse the change and go ahead and build the field according to the original requirement.

That was the whole idea behind it. The Israelis saw that, but there wasn't much they could do. I told them, if the field had to be built in three years and we got a year and a half down the road and the operators got a different idea for the length of the runway or some other feature, there was no way in a job like this that you could go back and start over and make the three years.

Therefore, the situation had to be that they got the requirement right in the first place. This had been the premise of Hartung's early work in the fall of '78, to come up with a decision. When we went to Israel, the presumed posture was that the Israelis had made up their minds what the field was going to be.

Q: That was the assumption that you took over there with you?

A: Yes, that the scope of the work was nailed down pretty well. Of course, as a practical matter, it wasn't. A lot of things had still to be decided. But we had said that we

couldn't undertake a three-year commitment unless they, by a certain date, had decided on everything. And then we would take off.

This was this first step that the agreement provided for, namely, that the Israelis would prepare this requirement and the two sides would get together and agree. The requirement would be complete and everything would be listed in there. Then if there was any change in that, both sides had to agree to it.

It didn't work out because it takes a very tough person with the authority to enforce a thing like that. If you look at the roles of all the different people involved, no one person really had the authority.

As the thing evolved, Paul became more of an intermediary between the Corps of Engineers and the Israelis. The sort of strict regime that the agreement provided for never came to be.

Q: But the Israelis who wound up having to work with the program and who referred to the agreement as a disaster from their point of view understood what the agreement contained?

A: That's right. I don't buy that it was a disaster because it was the deal that Weizman had made at Camp David. When the Israelis came to confront the notion of this offshore project, they didn't like it.

Of course, things changed. The economy changed. The Israelis turned around and wanted their industry to participate much more than had originally been contemplated. And the Americans acceded to this.

One of the early things it produced was some unhappiness because some firms like TAMS [Tippetts-Abbott-McCarthy-Stratton] had gone into this at considerable sacrifice, anticipating that there would be a big amount of design work. As it unfolded, the Israelis ended up doing a large share of the design. And the American firms that had come into these joint ventures to help with the design did not get anywhere near the work that they had looked forward to.

In TAMS' case, they got into a problem with the Arabs. I don't know how severe the blacklist was. But they definitely were not allowed to participate in certain Arab work—Saudi work—because they had undertaken this work with Israel, which was not an uncommon situation. Then, when they didn't get the work in Israel, they were out. They had given up the Arab work without getting commensurate work from this source.

Q: You were satisfied with how that agreement was originally written?

A: I was definitely satisfied. I thought we got most of what we went after. We were successful because Weizman didn't want his people messing around. Of course, I wasn't privy to their internal conversations. But they had all these different things they wanted, and at one point I thought it was going to take weeks. I said to them, "Well, I think I'll just leave and go back to the States and come back when you all are further along."

The next day, they dropped most of their demands. Whether they consulted Weizman, I don't know. But I can only conclude that they either consulted him, or more likely, they thought about how they would explain to him why I had left and decided that was one they didn't want to get involved in.

Q: Were the Israelis as satisfied with the agreement as you were?

A: I think at the time, the people that we were working with were not that unhappy. They were very courteous to me. [Richard M.] Dick Viets, who was the U.S. deputy chief of mission at the time, was very complimentary about the agreement. He said he was amazed that we had been as successful as we had in getting this agreement from them. But I also got the distinct impression that he felt that there was no great discomfort on their part.

Granted, certain people didn't get a voice. But, of course, there wasn't at that time an actually appointed Israeli project manager. That came later. That was one of the things that led to a change in the Israeli attitude—when they had a man that felt that he was in charge, or at least responsible. He ran into the fact that the agreement between the two governments didn't provide much leverage for him to get his way. Then, of course, he was unhappy.

Q: He's the one that called the agreement a disaster. We can see why.

A: My view is that [Brigadier General] Moshe Bar-Tov was a good man. But we never agreed that there would be an Israeli that would have the kind of authority he sought. He came along and he had a different concept of his role from ours. We never agreed, and I never felt at any point in time that the Israelis should have the voice in the way the job was done that Moshe wanted.

Q: That's an important point. That doesn't come through in a lot of the records of the project.

A: I wasn't around anymore. And the guys that were running it probably didn't have that conviction.

The agreement that was made was the following: we would come up with the first \$800 million, and the Israelis would come up with everything else. That was the deal that Weizman had made at Camp David.

When we got over there to negotiate this agreement, there were some second thoughts on the part of the Israelis. They said, "You, not we, made the estimate of what these fields are going to cost. How do we know that you have accurately estimated the cost of these fields? Therefore, you're asking us to make an open-end commitment to pay for larger fields, more money. And we've never had a chance to come up with our own estimate of what this will cost."

My response was that the thing that will cause a change in the cost is if Israel wants more elaborate fields. We have made an estimate which we were very confident of, if you stick with the requirements of the Hartung study. But if you come up with a lot of other things that aren't included in the Hartung study, then they'll cost more. Obviously, it's up to you to pay because the agreement that was made at Camp David was between Brown and Weizman for a certain type of airfield. If you want a fancier field, you can have one. But you should not expect the United States of America to pay. Our obligation is limited to \$800 million.

What happened once the construction began was the following. The Israelis saw the way we were doing, and they saw what we were spending for some things, such as the billets for our personnel and a swimming pool and some other amenities. They hadn't quite grasped before that these were going to be included and that the money we were spending that way would not be available to spend on some other features that they would like to have.

They felt that they should have a voice in how this was done. I wasn't there making the arguments. But when I heard about these disagreements, I thought that the money we were spending to take care of our people was not out of line with the estimates we had made in the first place of what it would cost to build these fields. Therefore, the Israelis didn't have a valid basis for challenging our management of the work. I don't mean that there may not have been some things that weren't done right. But I did not buy the basic idea that we were spending too much on some things and, therefore, they were being deprived or were having to pay too much.

As a minimum, they would not get the savings of an underrun. That was the source of this whole management argument which, in my opinion, the Americans should not have entertained.

I think the Israelis were encouraged to pursue this because Paul Hartung shifted his position to be that of an intermediary. One of the reasons that came about was the way in which the whole thing was set up. Hartung himself did not have as great a voice in the management of the construction as he probably had thought he would back in April of '79.

The Corps came into this thing with the idea that Paul Hartung would have the same role as the AFRCE [Air Force Regional Civil Engineer] normally does, which is a very strong voice in requirements, but little or no voice in management of the construction.

Hartung, on the other hand, had the attitude that he was the project manager and this should give him a voice in the management of the job. All of this led to a lot of argument. If they had stuck by the agreement, there wouldn't have been an argument.

But that's very typical of working with Israel. If you indicate a willingness to accommodate their views, they will keep using that to whatever limit they can because they've had to scratch a lot. Whenever they're in a relationship with anybody, they're scratching.

Some people criticize them for this. I don't think you should criticize them because I think that's the way they've survived. The criticism is of the people that have agreed to this. What you need to do is say, "Fine, but, you know, that isn't the way that it is." And if they come to realize that it isn't that way, then they'll stop. They won't waste effort there. They'll go over some other place where there are people that will give way.

Q: Is what you have then, in this case, a situation where the negotiations actually are ongoing, even after the negotiations are done?

A: The answer is that in every international relationship, the negotiations never end. I don't care whether it's with Saudi Arabia or Japan or Korea or Germany or you-name-it. We had 75 customers and the negotiations were continual.

There is a problem in that not everybody sees it this way. Perhaps the Corps didn't completely see it this way either and got into a little trouble that way. But, no. That's par for the course. It's just one big negotiation. And the agreement is just one step. It's an important leg up. But it doesn't solve the whole problem.

Q: Did you read Stephen Rosenfeld's essay yesterday morning in the *Washington Post* [Sunday, 31 March 1985] on Jimmy Carter's new book? It's in *Book World*, and it was on the front page. You know his new book, *The Blood of Abraham*? And Rosenfeld says—I don't know how he knows because he hasn't negotiated especially—negotiating with the Israelis seems to him a process by which you get

beaten down so hard by the end that you're glad to sign anything and think it's a victory.

A: That depends on whether you're tough-minded or not. But the problem for the U.S. executive is that there are so many supporters of Israel in the U.S. Congress and the Jewish vote is such an important factor politically in America that there are limits to what any President can do in being tough with Israel. The domestic political dimensions enter in. There is no question that's an important factor in Israel's approach to the problem.

Q: You said that you had no expectation of such a strong program role by the Israelis, even in March of '79. Yet very soon after that, they set up a pretty large and strong program management organization. How did that happen?

A: It was their country. I knew they were going to have a project manager. I don't remember that his role was particularly spelled out in this agreement. There were references to the Ministry of Defense and to their representatives. Only one project manager was mentioned in the agreement. That was the U.S. project manager. Then there was the Ministry of Defense representative. That was the Israeli name used. Then there was a construction agent mentioned. So if you look at the agreement, you have the three basic parties—the project manager—

Q: That's General Hartung?

A: That's General Hartung. The construction agent—that's the Corps of Engineers. And the Israeli Ministry of Defense. There was no mention that they would have a project manager. That was their choice. I think the change reflects the dynamic personality of Moshe Bar-Tov who came in, was given this job, and started building his empire.

Q: What do you think of how the Department of Defense organized internally to execute this program—the arrangements between the Corps and the U.S. Air Force?

A: That wasn't handled too well. But it wasn't disastrous. [Major General William D.] Bill Gilbert of the Air Force, [Major General William R.] Bill Wray for the Corps, and I worked on this problem. Jack Morris was a player as well.

The other two people that were involved in this were [Antonia Handler] Toni Chayes and Dave McGiffert. When we started, Toni Chayes was the Air Force Assistant Secretary for Installations. I don't remember that Bill Gilbert particularly involved her at first, but she, of course, was very interested in things of this type. She was very interested in the situation with Israel. She's a very capable attorney.

She came into this with a different idea of the management than we had at the time she came in. The agreement with Israel was already signed—thank God—because I think if she had gotten into that, she probably would have tried to change it so that it was more in Israel’s court. She was very concerned that we had set this up so that we wouldn’t pay adequate heed to Israel’s needs.

Q: That’s a peculiar concern for—

A: You have to consider the fact that she and her husband are prominent in the Jewish community in the United States and they’re part of a group that believes very strongly in the role that the U.S. must play in helping Israel mature as a country and be capable. She was concerned that a bunch of U.S. bureaucrats not be allowed to neglect Israel’s basic needs.

She felt we had set this up so that Israel wouldn’t necessarily have an adequate voice in what we did. She didn’t necessarily believe that out of the goodness of our heart we would take care of everything. She became active in this, and several things happened that were important in terms of negotiating back and forth. One thing happened which I told Jack Morris at the time was a big mistake, but he didn’t agree with me.

Bill Gilbert, Bill Wray, and I had this U.S. internal interagency agreement ready to be signed. Toni Chayes was out of town. There was some aspect of it that wasn’t crucial that Jack wasn’t entirely happy with. So he said that he wanted to hold up and he wanted to talk to Toni Chayes about this.

Q: Do you remember when this was?

A: No. I could look it up. So we didn’t sign it. Toni came back and rewrote the whole agreement. We were in much worse shape when she got through than we were before. It took us another month or so to get it back to where it had been. In fact, I don’t think we ever got it back to where it had been. We should have signed it before she got into it and started rewriting it, trying to give the Air Force more voice in things and get things so complex so that you couldn’t tell who was in charge.

Q: I saw that in her work, that she was trying to give the Air Force a greater role. And I’m having trouble tying that to an interest in seeing that Israel has a stronger voice. Is that merely because she was in the Air Force?

A: I don’t think you’d ever see that. But I think that was a factor in her view.

Q: I see.

A: I would not want it to be thought that there was anything wrong in this, because I don't feel that way. She just had a different perspective on the relative stake of everybody in this outcome, and she was very concerned that the construction people would be driven to do the following: we'd do it our way and would not give sufficient heed to what Israel needed or to the fact that it was a bilateral program between two countries. When you have that kind of a program, each side needs to have an adequate voice.

I think, first and foremost, that she was concerned that the operational needs of the Israeli Air Force would, therefore, not receive as much attention as they should. That's the link, because that was the channel through which the Corps would get the operational requirements.

I think probably Toni Chayes' involvement rippled down into the attitudes of the people. Hartung felt reinforced in his role by her support, and so forth.

Dave McGiffert felt she was another presidential appointee in the administration. He felt the need to pay heed to her concerns and not simply turn them aside.

We finally did get the interagency agreement signed. The most important thing that occurred in the whole business was that I got the Air Force to agree that, if I gave them the \$800 million, they would immediately give it to the Corps of Engineers.

Q: Whose idea was that?

A: Mine.

Q: Why?

A: Because I knew that if the Corps didn't have the money, the Air Force could badger them continually. At the end of the project, when it came time to make some adjustments and the Corps needed a little bit more money, the Air Force used the withholding of this money to try to force the Corps to do all kinds of things.

But the first \$800 million just went over. It took 24 hours. My controller signed the paper, and 24 hours later, the Air Force controller organization signed the money over to the Corps. Without that the airfields probably wouldn't have been finished on time. If the Corps hadn't had that money and been able to move out, the Air Force would have been after them all over the place for all the nitpicking details, and they never would have gotten the job done.

Q: Why did you know to do this? Could you see it coming?

A: Sure. I'd worked with a lot of different people in the construction business, including the Air Force. That wasn't particularly an Air Force trick. Any program manager that has control over money uses the money to make people do what he wants. I knew the personalities involved here. I knew Paul Hartung. I didn't know about Moshe Bar-Tov, but I knew Paul. I could see from my experience in managing things.

When I was in charge, I always used the funding approvals. I had seen this done over a span of 30 years. I had watched where, if you wanted something done a certain way, you didn't approve the money until everybody was lined up that you knew would be involved.

But that wasn't the mechanism we had set up. The mechanism I had visualized was that we were going to get this requirement approved. Then they were going to stand aside and the Corps was going to build it in accordance with that requirement, because if they only had three years, they couldn't stand change orders.

They had to decide at the beginning what they were going to do. I knew this because I'd been involved in a lot of different construction. There had to be a mechanism to force them to agree to it. They got tied in some knots over this. But basically, they got it right.

Q: Mrs. Chayes recognized this and tried to fight the turnover of all this money at one time, didn't she?

A: I think her concern arose more after it had already been done. She may not have liked that idea, but she certainly didn't put the weight of her position behind not doing that. I made the arrangement with a long-time, very capable Air Force manager in her office. He knew we had to get on with this. He had been involved with many things like this. He wanted to look out for Toni's concepts here. But he also knew that you had to get on with it.

Q: Was that [Deputy Assistant Secretary of the Air Force for Manpower, Reserve Affairs, and Installations] Joe [F.] Meis?

A: That was Joe Meis. Joe was a very capable guy, a very practical guy, and he had been engaged in this business between the Air Force and the Army Corps of Engineers for years. He knew that you won some and you lost some on this, and that there was give-and-take. I didn't discuss this with Joe, but I suspect that Joe knew that if we got this money down to the Corps that the job would go and then we'd save a lot of wrangling.

When more money had to go later on, and there was all the wrangling, I think that proved that.

Q: She seemed very frustrated in negotiating with the Corps of Engineers. I've seen some of the notes that went back and forth. It seemed to cause her a lot of trouble.

A: She was, because she approached the thing from the legal point of view. We approached the thing from the practical, construction management point of view. There's a difference. Any good lawyer believes that the truth is what you can convince 12 people to believe. It doesn't matter what the physical world is. If you can get a jury to believe in something, that's true. In terms of an agreement, it doesn't matter how impractical the agreement is, if the two parties agree to it, that becomes the control.

The construction manager comes at this problem differently. He tries to think about really two things. One, what's practical to do in terms of time and money and effort. And the other is unity of supervision.

Lawyers don't mind at all writing an agreement to which six people have to agree before anything can be done. That's just more business for them, if people can't agree. But the practical construction manager, or manager of any large program, is very anxious to have one person in charge and have that person's word control, because he knows that then you can hold that person responsible for the results, and that that person will be motivated to get on with it.

You can look and see some of this litigation. They don't, in most cases, care whether the thing is ever built or not. We need both types in this world. But Toni brought to this problem a different view from the practical people. If her memos reflect some frustration, it's because people like me, who had been doing this for 30 years, weren't to be turned away by her approach. The United States had committed itself to build these fields in three years. People like me knew what it would take to get that done. Toni had a different focus.

Q: What was General Morris's role at this time? Did he consult with you a lot? Did you consult with him?

A: We talked a lot about how to do the management. He thought at one time that he might have some success with Toni, as he's had with many people. But I think he came to realize that she had a somewhat different set of priorities.

Q: It seemed to me that you wound up with the same kind of situation you just described with the Israelis—where you set up an agreement finally. And yet afterward, there are constant efforts to modify the agreement—I guess primarily coming from her, right?

A: Yes, and I didn't get involved in that too much because my view was that it wasn't going to be modified. It had to be modified by mutual agreement, and there wasn't

going to be any. We weren't going to agree to modify it. Therefore, it would remain as it was.

Q: My chapter on that episode is called "The Diplomacy of Construction" because it seemed to me that the negotiations between the Air Force and the Corps were no less complex and difficult than between the United States and Israel. Is that fair?

A: That may be. It might have been more difficult because there were so many different people into it. But as I say, a lot of it was somewhat a self-inflicted wound because early on, Gilbert and Wray and I had agreed on something. Had they put their names on it right then, most of this wouldn't have occurred. I think that Toni might have sought a renegotiation of it. But she would have been working from a very different base, if the thing had already been signed.

There was no requirement for it to be signed by her. Bill Gilbert did not need her authority to agree to it, until she became involved. As far as he was concerned, this was an agreement of a type that he could conclude with his counterparts in the Corps. If he had done that, that would have made it hard to change.

Q: Do you remember what made General Morris back off from this?

A: No. I could probably find out, if I dug out my files from Suitland, Maryland. I just don't remember whether it was some wording about who was going to do what to whom, or whether it concerned the money, although I can't believe it concerned the money.

Q: You got what you wanted essentially with the money anyway.

A: The agreement pretty well provided for the money to go directly.

Q: That's an unusual arrangement. I can see why you perceived that it was necessary, but usually in military construction for the Air Force, it's a year at a time or in increments. It is an unusual arrangement, isn't it?

A: There was an important difference. That was one of the arguments we had. If the Air Force has a requirement to build an airfield, and the Chief of Staff of the Air Force and the Secretary of the Air Force go up to Congress and get \$500 million appropriated to build an airfield, and they have their whole hierarchy involved in configuration of this airfield, and they then, because of the way things are set up, turn to the Corps of Engineers to build it, they have a lot to say about the details of what it will look like. In this case, the U.S. Air Force was simply a liaison between the government of Israel and the U.S. Army Corps of Engineers. At various stages in the game there was discussion about the fact that we didn't need the U.S. Air Force at all.

However, as far as I was concerned, it was fine to have an AFRCE-type organization, headed by Paul Hartung, which would be the group to receive the requirements from Israel and to negotiate with Israel on these things. Then, when they got the requirement nailed down, to turn this requirement over to the Corps of Engineers to build the project. That was all right with me.

But when it came to thinking that the Air Force role should be expanded and that they should have the same kind of voice in this project that they had for a project built for the U.S. Air Force, this didn't make any sense at all, as far as I was concerned. Therefore, I didn't want to aid and abet this interpretation of the relationship. That's the reason why, I guess you could say, I didn't support the concept of Hartung's being a program or project manager in the traditional sense.

I didn't have any trouble with his being named to the program or project manager, as far as the relations with Israel were concerned. He was that, in that agreement. But as far as having that similar role, relative to the Corps of Engineers, no, I didn't agree with that.

I think we should put at the beginning of this interview or early on the fact that I found Toni Chayes to be a very bright, versatile person, and a charming lady. And I really enjoyed my association with her. She was a tough adversary, but we just didn't agree on some fundamental points about this whole arrangement.

Q: I must say you have a more balanced view of her than some of the Corps people I've talked with. She apparently really caused some rage and frustration in the Corps of Engineers.

A: That may be. But I was older than they, and I had spent more time up at OSD than they. And they were closer to the nitty-gritty, so it was perhaps more painful for them, easier for me to stand back from this.

Of course, the whole business of this audit that she caused was, in my opinion, a mistake. But once it was started, it couldn't be turned off. I felt to have an audit—here you had a job that was only going to last about two years, really. To have an audit after the thing had just barely begun wasn't the way to get results.

Q: It was just a distraction.

A: Yes, it was just a distraction. But it represented Toni's way of somehow intervening in this since she was frustrated from intervening through any management channels.

Q: You didn't really envision a three-part management framework when the project was first created, did you?

A: No, not at all. It was unnecessary.

Q: You've been a division commander, and I would like to know what you think about handling this kind of a construction project through a stateside division. Was that a good idea?

A: We handled most jobs like this through some division. We couldn't handle it out of the Middle East Division in Riyadh. That was politically impossible, although that would have been a logical way to do it, just on the basis of geography. The next closest division was the North Atlantic Division [NAD]. The North Atlantic Division had been engaged over the years in many overseas efforts—all the work in Labrador, North Africa, and so forth. That was a logical way to do it, from the standpoint of the way the Corps operates.

OCE is not supposed to be an operating organization. They're supposed to give the instructions to the divisions, and then the divisions pass the effort, the responsibility and the authority to the districts, and the districts are the operators. So, to me, giving this to the North Atlantic Division made a lot of sense.

Q: Were you involved in that choice? Were you asked your opinion?

A: I don't remember. But it seems to me there wasn't that big an issue at the beginning. After all, when you were going to let these contracts and all that, that certainly didn't go on in the Office of the Chief of Engineers. And there wasn't time. This is always the case. There wasn't time to set up a whole new outfit. To get going, they had to take some existing outfit and get them started.

It's perfectly true that they had to create the districts. The echelon in the Corps of Engineers that does this is the division office that has all the various types of people that you need—the counsel, personnel, and you-name-it.

I don't remember that there was a big controversy about this. Later on, there got to be an argument because of the personalities involved. But at the beginning, I don't think that there was any question that was the way to go. [Major General James A.] Jimmy Johnson, of course, was the division engineer when the thing got going.

Q: Once they had it under NAD, was it a good idea to remove it?

A: By that time, I was trying to stay out of it. Because I had been involved earlier with this thing, all the various parties to this controversy would call me up and tell me what was happening and ask me what I thought. I tried to give honest answers. But I tried not to become involved. To an extent, I had a whole other set of problems without this one. I didn't feel that it was my business to tell the Chief of Engineers how to run this job, any more than I would have told the Army how to procure M-60 tanks or the Air Force how to procure F-16 aircraft or the Navy how to do their thing.

If something that was being done by one of the services ran contrary to our standard way of doing business or got us into a mess financially or got us into a mess with some other government, then I did sometimes get into it.

This thing did not seem to be of that type. There were management problems. There was the problem that I perceived that they had not really come up with the requirement and the related costs, as we had contemplated in the agreement. The whole idea was to have some number of lines that represented the requirement, however many—whether it took 50 or 500, and to put a cost opposite each one of those and a schedule opposite each one of those, and manage the thing around this structure.

The minute the Israelis said, "We want it painted blue instead of white," just go in and say, "All right, the damn white paint is sitting out there. The lead time on the paint is six months. You're going to delay the whole thing six months while we get the other color paint, and it's going to cost you for the paint. It's your money. However, we can't agree to it because you can't accept the six-month delay that will bust us past the implementation of the treaty. So we're not going to agree to it. Since you said back here that you wanted it white and we agreed on that, white it will be."

That might be a simple-minded view of the way this thing was supposed to work. But that was the way it was supposed to work. I think everybody understood it at the time. But unfortunately, I think at the early stages, they didn't get it set up that way adequately. Then confusion entered in.

Q: You said you were called frequently by a lot of the participants. Did General Morris try to involve you?

A: He talked over with me things he was thinking of doing because, with this ongoing thing with the Air Force and with the relations with the embassy over there, Jack wanted to be sure that McGiffert and I would support him, if they got into some wrangle. He was correctly concerned that the Corps of Engineers had been handed this thing and that everybody had said, "The Corps will get this job done." He didn't want something to happen that caused a wrangle over this and that tarnished the image of the Corps and the Corps' reputation. And he knew that I was watching it.

One of the elements of this agreement was a report that was to be sent and was to come to McGiffert. McGiffert had charged me with receiving and reviewing this report for him. I don't know whether that memo is somewhere around or not. But he had definitely charged me with keeping track of this thing for him.

He said to me that he wanted a chain of responsibility so he could assure Brown that we were going to finish the airfields on time and that the Department of Defense would not be in the position of having failed to deliver on these airfields. They were very concerned that, if there was any pretext, this might cause backsliding on the Camp David accords. If the fields weren't ready, then Israel would not complete the redeployment out of the Sinai in accordance with the dates, and then the peace treaty could come unraveled. They did not want the Department of Defense to be responsible for any shortcoming that would lead to an adverse impact on the peace process.

Q: Did you ever get a sense that there were Israelis who had interests in not having the bases done on time?

A: No. I didn't get any such sense. As a matter of fact, the actual redeployment to the fields took place early. Of course, [Major General David] Ivry, who was the commander of the Israeli Air Force, was absolutely top-flight. The Israeli Air Force is really good.

Ivry knew he had to get his planes out of the Sinai. Although they had their own ideas about the way they wanted the fields, there was never the slightest hint that I saw that the Israeli Air Force was trying to do anything but get this job done.

Q: Were you involved in whom the Corps sent over and whether there should be a general or a colonel, or stuff like that?

A: Yes. Jack had different ideas at different times about this. He talked to me early on about the fact that as long as Hartung was there and was a general, it wasn't necessary for the Corps to send a general.

I agreed with that. I think he and I probably talked about the fact that Jack Gilkey was going to be his nominee for that job. But, of course, it wasn't a question of getting my agreement to that. It was a question of sounding me out as to what I thought.

I said I thought it was all right to start out without two generals. But then later on, it became evident that it wasn't working too well and that it would have to be changed. I know that at one point my attitude on the thing was simply that we really didn't need an Air Force general. At one point in this whole discussion, there was an idea that we might try to persuade the Air Force to let the Corps man be the project manager.

The agreement talked about the Ministry of Defense, the program manager, and the construction manager. We thought about trying to get the Air Force to agree that the Corps man would be the program manager. I'm sorry. I just can't think of what the chronology was when all of these ideas came up.

I don't remember taking a strong position on the issue of moving the thing away from North Atlantic Division to OCE. I think I was against that, but I don't remember taking a very strong position with Jack against doing this. Again, I didn't really think it was up to me to tell him how to do that.

Q: The agreement that you made in 1979 seemed to be under frequent pressure for modification from both the Israelis and the Air Force, both in our department and outside. How did the U.S. government handle these pressures? I'm talking about the embassy and the program manager, in particular.

A: I think that basically what Paul Hartung tried to do was to be evenhanded and, therefore, to dispel any basic reason for changing the agreement. If the project was going ahead and if the Israeli needs were being met, some piece of paper that talked about who talked to whom and so forth wasn't worth reopening.

They would have gotten nowhere if they wanted to reopen it. I'm sure [Ambassador Samuel W.] Sam Lewis was smarter than that. He might have been unhappy with what it said. But I think the notion of reopening that would have been a loser.

Q: When it came down to specific details like changing the Israeli involvement, changing the amount of money that went to Israeli contractors, or that sort of thing—

A: That wasn't hard because the agreement wasn't ironclad on that. As far as the work going to the Israeli contractors, for example, the agreement set up limited obligations to do procurement in Israel and to give work to Israel. As long as the U.S. was willing to give them more work, there was no issue. The agreement was not written in such a way that we couldn't give them more work. The agreement was written in such a way that we didn't have to give them more work, if the U.S. managers didn't want to.

It was quite easy to accommodate the Israelis on that. From a legal point of view, it might have been difficult to carry out. But what we had to say was, "We're not going to make a big thing of this. If you want more work, we'll allow it."

Concerning Bar-Tov's having a larger say, if he wrote all these letters and had all these meetings, they could pay attention to what he would say to do, instead of saying, "Look, the agreement doesn't provide for you to have any say in this. Therefore, we're going to leave the meeting." They didn't do that. The way they met it was to say,

“Well, we won’t insist on interpreting the agreement. We’ll just allow a loose interpretation,” which is what they did.

Q: Did the embassy try to get involved, do you know—well, to be blunt and explicit about it—did they try to get [Lieutenant] General [Bennett L.] Lewis out of the program?

A: Well, I don’t really know what happened. Ben was rather forthright in telling them what he thought was right and wrong.

I think many of the criticisms that Ben made were probably valid. There were too many cooks in there. It’s conceivable to me that the Corps of Engineers’ managers in Israel and the contractors were not doing the job they should have in setting up the management structure, getting all this into a computer and so forth so they could keep track of it. From the reports I received, they did poorly on that. This whole business of getting the requirement cleanly stated was not done well. Whether this was due to the personalities of the leaders or what, I think the fact that the thing was divided between the U.S. Air Force and the U.S. Army Corps of Engineers couldn’t have helped.

Ben was pretty tough on this. He was the kind of guy that could get it done. However, a lot of people got bruised in the process. I guess they decided that the damage being done by this wasn’t worth it.

I think if I wanted to get something like that set up and running, there are few people in the Corps that would do a better job at this than Ben Lewis. He is tough-minded. I think he was right in what he wanted to do. Possibly his methods didn’t take adequate account of the sensibilities of the Israelis or the embassy or something. That’s possible.

I can see the Israelis complaining to the ambassador about Ben. If Paul Hartung and Moshe Bar-Tov were over there trying to tell Jack Gilkey what to do, I can see Ben going over there and telling them to mind their own business.

Q: Yes, I’m sure he did.

A: Then I can see some political type going to Sam Lewis and saying that Ben Lewis was not giving adequate consideration to Israel’s needs.

Q: This program caused him a great amount of pain.

A: Ben saw this as an important program he had been given responsibility for. He wanted to get it right. Then to be made *persona non grata* is pretty tough.

Q: Does it surprise you, with the unpredictable way in which the management evolved and the economic requirements and so on, that the thing got finished on time?

A: I must say that there was a lot of turbulence. But I'm not sure. I can't remember about the various people in Israel whether there was some continuity, in spite of all this. I mean, whether the resident engineers remained in place.

Q: In fact, it was anything but continuous at the sites.

A: I don't know that it surprises me. You certainly can't count continuity as one of the strengths of the project and the reason they did so well. But evidently somebody was doing something right. That's an interesting question that I've not thought about a great deal. That is, where was the continuity that kept this thing on the track?

I'm really not sure. There was continuity in some of the major staff sections in Israel, in NEPO [Near East Project Office], in Tel Aviv, but not a lot.

Q: Jack Gilkey was there the whole time.

A: He was there. Charlie Thomas was there almost the whole time. The procurement office had several heads. Construction had a couple heads.

Q: What about Bory Steinberg? Was he there pretty much the whole time?

A: He did not stay past 1980. There was continuity at the deputy level in the area offices. Maybe that's where we look for the stability. But when you look at it from the outside, what you're struck by is not the stability, but the reverse of it. There are so many changes involved. I was amazed, initially.

That goes on a lot in this world. I think it's a mixed bag. Sometimes you don't suffer from it, and sometimes you do. You can see some projects that have really suffered from a lack of continuity. This one does not seem to have.

Q: Is there anything else I ought to ask you about the Israeli project

A: I think you've covered the most important points. I think that the Corps showed its capability to get on top of a job. You know, this thing was done on fast-track, in which they let a cost-plus type of contract when a lot of the design is not completed. The Corps had done a limited amount of that work. But they could not be called vastly experienced in fast-track work. Yet, they managed to get on top of that and do that. The proof of the pudding is what happened. They did get finished. And my recollection is that they were pretty close on the cost estimate, too.

Q: Extremely close.

A: The arguments over the money at the end had all to do with change orders and things that were relatively small. Among other things, they had to do with arguments over the amount of money that various things that were not yet costed out would cost. In other words, there wasn't enough money, if they cost as much as they might. But in the end, I think most of them didn't cost as much.

The Corps didn't want to be in the position of being left without a contingency down at the end when they were trying to wrap the job up. But they didn't really need the contingency, as it turned out.

Retirement, 1981

Q: I read on the front page of the *Post* that your successor, who was [Lieutenant] General James Ahmann of the Air Force—was he your successor once removed?

A: That's right. My immediate successor was Eric von Marbod, who had been my deputy. But he was in the job only about five months and then retired. Then Jim Ahmann, who had been his deputy, took over.

Q: The thing that surprised me, and it was on the front page of the *Washington Post*, when he had retired from DSAA, he had gone to work for Northrup and was on the front page of the *Post*, criticizing the Carter administration's arms policy—which I understand is vulnerable to criticism—advocating the sale of more arms. Well, he was an arms salesman at the time. And I wonder about the propriety of that kind of thing. I remember the story about your father and the National Press Building, and there seems to be a different set of values at work here.

A: There are two things that need to be said. First, I think that there is no question that if you go back to my father's time or to my grandfather's time, they had a much more reserved view about their role.

I have to tell you this story about my grandfather, my mother's father, who was Colonel Rogers Birnie, a very eminent ordnance officer in his time and one of the people involved in the original concept and design of built-up guns.

I don't know if you're familiar with this subject, but at the time of the Civil War, all cannon were cast. There's a limit to the strength of a cast cannon. A built-up gun is made in such a way that the inner tube is under compression and, therefore, capable of withstanding much higher pressure.

There are various ways to do that. One is to wrap the barrel of the gun with a cable. If you take the steel and forge it and then you put a case on it so that the interior of the tube is under compression, when the projectile is fired, the first part of the stress is taken up bringing it to a neutral point. Then the second part is putting it under tension. So you get a much stronger gun. All modern artillery are made this way, all big guns, all those 16-inch guns on the battleship.

My grandfather graduated from West Point in 1872. From about that time to 1900, modern artillery was developed in Europe and the United States. He was very much involved in this.

When he came to retire from the Army about the time of World War I, one of the gun manufacturers offered him the presidency of the firm. My grandfather said that it just wouldn't be appropriate for him to assume the job of president of this firm, given the fact that he had been, in fact, the acting Chief of Ordnance of the United States during the early part of the war.

Basically, he didn't want to lend his name to this. There was no law against this, but he didn't feel it was ethical. He said he'd be very glad, if they had any design work that they wanted him to do. And they said, "Oh, no. We've got plenty of designers. We wanted you to head the company."

That's another example of the way they viewed things in those days. We definitely have a different view today. That's the first general point.

The second point is that, in the area of foreign sales, so far at least, there is a different ethic from the ethic that applies to domestic procurement. Let me see if I can explain the difference, as I see it.

In the case of domestic procurement, we have all kinds of limitations on somebody who has been working for the Department of Defense going out and joining industry to turn around and sell back to the Department of Defense. There are laws against it and there are ethical principles and so forth.

We have a different attitude if those same people join industry for the purpose of selling to a foreign government because we don't view it as inappropriate, or at least many don't. After all, this officer never worked for the foreign government. His position as the official of a company selling overseas is very different from his position as somebody who was in authority inside the Department of Defense. He's not trying to sell back to the outfit he worked for.

So you don't find all the ethical strictures there, or the legal strictures.

Personally, I never felt comfortable with the proposition that I would deal on behalf of some company with governments that I had been dealing with as an official of the U.S. government. But that isn't, in my opinion, something that is entirely a matter of ethics. It's just my personal equation.

There have been a great many people leave the foreign sales program, take jobs with industry, and do marketing work among foreign clients, a great many. It's a common practice. I haven't read a lot of criticism of this in the *Washington Post* or anywhere else. It seems to be viewed differently. Jim Ahmann is just one of hundreds who have been involved with the contractors who sell overseas, whether they be Northrup or McDonnell–Douglas or General Dynamics or LTV or you-name-it.

There are hundreds of retired Army, Navy, and Air Force officers who work for these firms, often on foreign sales. Some of them have been in foreign sales before in the government, and some have not. So it is a different ball game from going to industry to sell back to the U.S. government.

Q: Ethical concepts are difficult things to get at, and they are difficult things to make judgments on. In fact, it's often presumptive to make judgments on the ethics, to question the motives of people.

But in the case of the Israeli air bases, where we had an area engineer who'd been a contracting officer for Atkinson for two straight jobs and then went to work for the company almost immediately upon retirement, you just wonder whether the system ought to—I guess you can't stop that. I guess that's the point. I don't know. Maybe you shouldn't.

A: It all depends what he was doing for Atkinson. But also, that's a somewhat different question of ethics. This is akin to the concern that has been written about recently in the *Post* that government inspectors at some of the plants—they're not called inspectors, they're called representatives—but people that oversee the inspection operations in some of the aerospace plants have gone to work for that firm after they retire.

That's a different set of ethical issues about whether one can infer any impropriety in the relationship between the government employee and the private firm because later on he made a business relationship with them and, therefore, he might not have been tough enough on them when he was working for the government. Otherwise, they wouldn't have loved him or something.

There have been a bunch of guys from the Corps that have gone to work for private contractors. Until recently, the view has been, as long as they weren't engaged in trying to sell to the Corps, they could do this. There has not been the inference of impropriety

that they accepted a job. Generally, people have not said, “Well, this reflects on the kind of supervision he exercises.”

I’m sure there have been instances, although I don’t know of any personally. I’m sure there have been instances where somebody had a supervisory relationship with a contractor which was abused in one way or another and there was a subsequent business relationship after the guy retired from the government. I remember one small incident which isn’t like that at all, in which a contractor up in Minnesota helped one of our lieutenants buy a new set of tires at a discount, and both got in all kinds of trouble.

There are definite violations that occur.

Q: Yes, and there are limits.

A: There are limits. But the matter of whether you could accept employment with a firm that you dealt with while you were in the government, I think the view in the past has been that that wasn’t an ethical violation.

Depending upon the job, I don’t think I’d have any trouble with that, either. I have trouble—and it’s partially my personality—when, in order to pursue a business relationship, I have to make contact with somebody with whom I’ve had either a personal relationship before or a business relationship before, as a government employee.

I don’t have any trouble at all with the following. I work now for Burdeshaw Associates, Limited, which is a consulting firm. In this job, we advise defense firms on things they should do to get defense business. We do not make any contacts with the Defense Department on their behalf. We do make contacts with the Defense Department to gather information, but not ever with this firm’s name involved. It doesn’t bother me. I think it’s perfectly legitimate business, if I make contacts with one firm in the course of that, to go over and try to sell my wares to some other firm.

Where I have trouble is, if I have worked with somebody in the Defense Department and have a relationship with that person, to turn around and try to use that relationship to get favored treatment when I’m pursuing personal business.

On the other hand, one can’t be ridiculous about this. Bill Burdeshaw brought me on partly because of associations we’ve had before, which he had thought were favorable.

The position I got as a senior fellow at the Georgetown University Center for Strategic and International Studies also came about because I was associated with some people there.

You have to be realistic. Few, if any, jobs are won on pure merit, particularly as you get to be more senior. You are chosen to do something because you're a known quantity. In fact, one would be very foolish to interview 50 people and not learn more about them than that. So most senior jobs in this world are gained through contacts.

If a firm is buying something, you may have a competition to try to be objective and select the best. The thing that causes ethical problems is where a prior association is used to gain favored treatment in some procurement activity where ostensibly the procurement is on an objective, competitive basis. That's where the ethical issue arises.

Q: You retired in 1981? Why at that time?

A: My time was up. I had already been extended twice in the job. Normally, the Army's policy was that you retired with 35 years' service. But I had been extended first for a year and then for a little bit more than another year. I stayed on long enough to help the new administration get started. I had done my 37 years and it was my time to retire.

Q: What do you look back on with the greatest satisfaction? Thirty-seven years is a long time, and maybe there is no one thing.

A: It's not so much a matter of satisfaction. I think I was extraordinarily fortunate to get the opportunities I did in the Army. I certainly didn't visualize at any point in my career that I would have as many different jobs to do, and every one of them was interesting.

I think it's incredible. I don't think I ever really had a bad assignment. It's perfectly true that in those early years when I was in the 1282d Engineer Combat Battalion, it wasn't a very good job. It was a good experience, because I learned a lot from it.

But after that, I just had one terrific job after another. I had all kinds of opportunities to do things. I was very fortunate in having a lot of good bosses. There were a few along the way that I didn't hit it off with. But I learned that you do have to get along with your boss, no matter who he is. If you approach it with that frame of mind, you don't get worked up if your boss doesn't measure up to your ideals. You just accept the fact that that's life.

It would be hard to say that any one job was that much better than the others. I had one disappointment. But that's putting it too strongly. I just didn't get to stay in most of the jobs as long as I would have liked to.

For example, I was the Director of Military Application in the Atomic Energy Commission and the Energy Research and Development Administration for less than two years. And I was the Director of Civil Works for less than two years. So I didn't really get the chance to do as much in those jobs as I would like to have. But then I got to do them both, so there's an offsetting factor. No, it's hard to say that one was more rewarding than the other.

Q: Do you look back at anything and say, "Boy, I would have done that differently if I had known what I know now?"

A: Definitely. Sometimes I had a chance to do things differently. For example, when I was in the North Central Division for three years, I approached some things differently when they came up a second or third time. Annual things, for instance.

If I encountered the same thing later in my career, I often was wiser about the ways things were. I think as I grew older, I learned how important it is to get people on your side on anything. I don't mean that in any selfish sense.

Results are accomplished with people. The higher up you get in an organization, the more you depend upon the efforts of the people that are working for you. To be a real success in anything, you have to get them working together and towards something that makes sense. Leadership is all important. There is no one style of leadership, and I don't think that a person can even apply the same techniques to different people. Some formulas perhaps work with most people. Your style may generate an esprit in the organization. But even then, with each person that you're dealing with, you have to think about how to bring that person along. Otherwise, you're doing it all yourself, which, of course, you can't do.

Q: Is there something else we ought to talk about?

A: I've enjoyed these interviews a lot. Maybe after I've been over them all, I'll see some points that I might fill in.

Q: Okay. That's great. I've had a great time. Thanks a lot.

A: Well, you've done a great job on it.

Q: Thank you.

Part II Vietnam Interview⁵

[Q: Would you describe the most challenging part of the engineer effort in the delta?]

A: Some tentative estimates of the effectiveness of engineers in the delta have been that it takes about twice as many engineers in the delta to accomplish a mission as elsewhere in Vietnam. This estimate has not been confirmed by any detailed analysis. It's just the impression of the people that have been following it.



Colonel Graves in Vietnam, 1969.

When you look into this, you might be inclined to think that it is because of the hostility of the environment to engineer work. I would say that in the dry season this is definitely not the case. The conditions are as favorable for engineer work in the dry season as they are anywhere in Vietnam, perhaps more favorable.

In the wet season, they are very difficult, but I don't think that they are any more difficult in the delta than they are in many other regions. The real problem, and this is the real challenge in the delta, is the support of these operations, and the basic support problem is movement. The road system will not support movement to all the construction sites primarily because the bridges are too low in capacity.

⁵Part II is not strictly speaking an interview. On 11 July 1969, Colonel Ernest Graves, commanding officer, 34th Engineer Group (Const.), Binh Thu, Republic of Vietnam, on 11 July 1969 responded to a series of questions that Captain Raymond F. Bullock had submitted in a memorandum.

The original questions from the memorandum are enclosed in brackets.

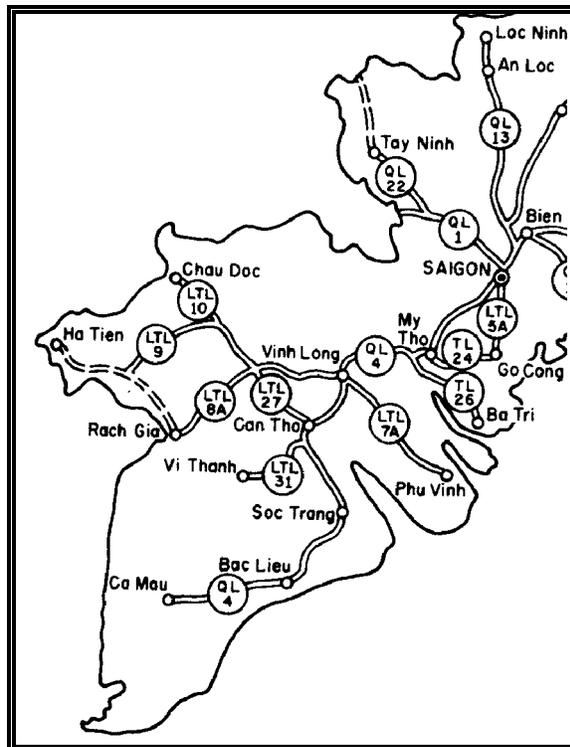
This means that we are dependent on a water line of communications for all our heavy equipment and our heavy construction supplies, not having the airlift capability. Given the priority system in Vietnam, these water movements are very time consuming. For example, the traffic management agency is allowed 20 days in which to complete a normal water movement. If you consider the number of movements required and the length of the various jobs, you pretty soon come up with the fact that half your time is spent waiting for movements.

There is no simple solution to this problem because the transportation people in Vietnam don't have the resources to support water movements all over the country. The engineers have to take their turn. One solution is to plan further ahead. But the military situation changes, and engineer plans have to be changed accordingly. There is no question in my mind that this is greatest challenge in the delta, providing adequate support.

Air is important for support in the delta, and air has been a problem. I think air has been a problem for the engineer troops all over Vietnam. They don't enjoy a sufficient priority to have enough air support. Either they're in organic aircraft for command and control, or in lift for heavier supplies. We've made various improvements; we've shared aircraft with other units, particularly the Saigon Support Command. But there is no question about it, we could do a lot more if we had more air than we now have.

Operation Speedy Express is an example of the effect of support. When you are given a priority, what is the best you can do? The construction work there, while interesting, was not a great challenge in itself. The relatively short time allowed and the difficulty of laying on all the movement incident to Speedy Express made this mission a much greater challenge to the group staff in the way of planning and coordinating than other operations which we have conducted.

At the other end of the scale is the LOC [lines of communication] program, a much more deliberate



Mekong Delta, Lines of Communication.

operation with more time to get into place. This is a much greater challenge to the battalions themselves that are doing the job because they have very large organizational problems to support this type of highway construction.

As far as the challenge to the group on the LOC program is concerned, it was a resource problem extending all the way up to the 20th Brigade, which was attempting to come up with enough earth moving equipment to do the job in the available time.

[Q: How did Speedy Express affect the later construction of QL-4?]

A: There's no question about the fact that Speedy Express had a serious adverse effect on this year's LOC program. At a time when we should have been making all-out preparations for the LOC program, we were doing Speedy Express. This was aggravated by the fact that the operation was in a suspended state for a critical period. We might have gone on to the LOCs had we known the fate of Speedy Express, but we didn't know it until later—the end of February, I guess, would be the time when the cancellation of the deployment of the Air Mobile Brigade was finally confirmed.

You've got to be honest about this thing. We originally started out trying to get facilities ready in December. Then it was slipped to January, which was very fortunate because we didn't have anything ready in December, and then it got deferred because of the threat north of Saigon. This gave us a grace period because we weren't able really to finish our Speedy Express work until the latter part of February and into March. Chi Lang was finished the latter part of February. The work at Moc Hoa carried on into March. Hindsight is better than foresight. If we'd known nothing was going to happen, all this effort could have been put into the LOCs.

There's another aspect of it which is that the command and staff elements, with all their attention focused on trying to do Speedy Express, just never got around to the planning and decisions that were necessary for the LOC program.

I don't know whether this is generally appreciated, but no headquarters to the very highest and no manager, no commander to the very highest can give equal attention to every problem he has. If you have been in these situations, you can see that one problem will be neglected in favor of another. There is no question, but the LOC program in the delta was neglected because of the attention which had to be directed to Speedy Express.

[Q: Does QL-4 fit into the overall excellent canal system of the area?]

A: As to the relation between QL-4 and the canal system, I'm not very knowledgeable about this. My impression is that the two serve different purposes. I've always viewed

the canal system as a rural communications net which supplied the farmers and by which they brought their produce to centers of population.

The highways are what I would call a bourgeois means of communication. They are much more the commercial means for the more bourgeois element of the society: the tradesmen, the entrepreneurs, and the city dwellers.

I don't mean that the highway isn't used by the farmers to get back and forth, but you don't see very many of them moving their rice on the roads. You do see trucks hauling rice and produce to a certain extent, but I would imagine just from casual observation that the great tonnage of agricultural produce in the delta moves by water and will always do so. It's not a commodity where speed is important. The heavy tonnages of rice move more economically by water.

What doesn't move economically by water is the more expensive goods that move over the road—animals, for example. You see chickens and this kind of thing moving over the road. You see the little people going over the road for trips to Saigon or driving their motorcycles over the road. It's a retail type operation.

The other big element that the road serves is the ARVN. Generally, the U.S. does not use the roads in the delta for supplies; we move our supplies by water or by air, as the case may be. The ARVN makes heavy use of the roads. Their main supply is by truck. The ARVN uses LSTs to bring supplies to ports in the delta, but from there their divisions are supported over the road. The U.S. 9th Division was supported quite a bit over the road from the Long Binh area to Dong Tam. But QL-4 further south is very important in the support of the ARVN 9th Division at Sa Dec and the ARVN 21st Division at Bac Lieu. A great many supplies move over the road from Can Tho up to Sa Dec and from Can Tho down to Bac Lieu. The big ARVN port operation here in Can Tho and QL-4 serve as the main supply route to these two divisions.

[Q: Would you comment on the effects that the rotation of the two brigades of the 9th Infantry Division will have on the group?]

A: It's really useless to speculate on what will happen to the security with the departure of the 9th Infantry Division. There's no question that the ARVN 7th Division is capable, but I think only time will tell. You hear both optimistic and pessimistic predictions. You just can't really tell, and I don't think you will be able to tell immediately. There has been a lot of trouble along QL-4 between My Tho and the Me Thuan ferry even with the 9th Division in place. Actually I think the road may be more secure between Vinh Long and Can Tho than it is on the stretch farther north.

But some indication of positive feeling about this is the fact that RMK is now engaged in a crash program to pave the road quite a bit of way with black base—at least as far as Cai Lay—and there are all sorts of plans that have been made to keep the road open. But I really can't say one way or the other.

[Q: How has the MCA-funded [military construction, Army] LOC equipment aided the group during your command?]

A: It was an inspiration to have the MCA/LOC equipment. I would offer only one reservation. As is almost always the case with something of this kind, the people that sell it tend to emphasize the simplicity of the equipment and of the whole problem. In other words, if we go out and buy something off the shelf, all our problems are solved.

I don't really think in the case of this commercial equipment that we have any fewer problems than we have with military equipment. We have all the same problems. We have the problems of skill of operators. We have the problems of repair parts. We have the problems of having people that are really expert in the equipment. The problems are all the same, but the thing that this equipment brings is unique capabilities to do a job.

For example, the self-propelled stabilizers that we use on the clay lime, the stabilization batch plants that we are using to produce sand cement, the segmented compactors that we are using for compacting the clay lime, the vibratory rollers for the compacting of the sand cement: these pieces of equipment provide us a unique soil stabilization capability down here—where we don't have any rock—that we would not have with military equipment. The equipment is much more productive.

But I would be the last one to claim that it's any simpler to operate or easier to maintain than the military equipment. It's equally demanding, and if any mistake was made with the LOC equipment, it was underestimating the difficulty of setting up an adequate support system for this equipment. Now that we know the need, I think the operation is getting organized very well. But we didn't have, at the beginning, the kind of training program we should, and we didn't have the kind of parts support, and we didn't have in country as many people who were highly knowledgeable of this equipment as we needed.

With the military equipment and with the warrant officers who have been working with it a long time, we do have people that are familiar with it. What clearly is needed for the commercial equipment is to have representatives from the manufacturing firms come in at the very beginning—representatives who are just as knowledgeable relatively as our warrant officers are with our standard equipment.

We have had some factory representatives, but we didn't have, as far as I know—I'm not familiar with the procurement contract—we didn't have a specific standard arrangement that every item of equipment would be accompanied into the country by a set of people from the manufacturer fully qualified to introduce the equipment. This is what I think should be written into the contract.

Now we have a maintenance contractor who has skilled maintenance people. But these are no substitute for factory representatives. They know this type of equipment, but they may or may not have worked on a specific item. For example, the stabilization plants are [made by] Cedarapids. We need a man from that company to come and tell us how to run this equipment. This is a big, complicated piece of machinery, and we don't have anybody that's familiar with the particular piece of equipment. We're overcoming these difficulties, and the idea of getting this machinery that's particularly capable is a marvelous one.

I am less sure that I agree with some of the items that we've gotten that have close analogies to military equipment. For example, the 600 CFM air compressors are fine pieces of equipment, but I'm not sure that I agree with having spent money to buy them. I'd rather use the money to get equipment for which there is no military parallel. One exception to this is the 5,000-gallon water distributors. In this case the MCA equipment is so much better than anything we have in the military that it's not really comparable.

On the subject of morale, the experience down here is that hard work out in the sticks away from the cities is the best thing for morale. The units that have the best spirit, the men that seem most satisfied, are people that are out working on a fire base or some other remote site. There are several things about this. One is that they are left to their own resources. They don't have the barracks "spit and polish" and all that. Another thing is that they are close knit out there; they rely on each other. When you put them in a town, they go off to town and get into trouble. They're not as happy getting into trouble as they are out working. This has been our experience.

I won't talk much about maintenance. The first and foremost problem we have in maintenance is that our whole army isn't adequately trained in this subject. Our operators aren't, our junior officers aren't. I guess nobody is adequately trained.

After a person has been over here working on a problem for 8 or 10 months, he knows an awful lot about it. But as people come over, they don't know enough. There is no question that it's a highly complicated problem that requires a great deal of skill and knowledge and ability to get right. We are amateurs at it until we are about ready to go home.

In the 34th Group, we've had a long uphill struggle to develop decent maintenance. There was a complete lack of appreciation, I would say, when I got here 10 months ago of how much effort, how much care, how much organization are needed. This is particularly true in the delta where, if we don't make the system work, we're not near enough to any sources of supply to short-circuit it. If you're in the Long Binh area and you're not doing it right, there are all sorts of alternatives. Down here if you don't have your requisitioning and everything else working properly, you have no alternatives. Next to the transportation problem, maintenance is probably the biggest challenge that you have down here.

[Q: Would you comment on the use of the 35th Engineer Battalion (Combat) since its move to the delta?]

A: The 35th came down in some respects under ideal circumstances, with one job and a clear understanding that they wouldn't be frittered away. They've done that job very creditably. They had their own problems with the delta, getting accustomed to the situation down here.

The pacing factors in their job have been equipment and rock. They did not have enough rollers and asphalt distributors for the job, and not enough rock was delivered down to their rock sites. Now we are starting to use them for operational support missions, and they do very well on these. The boost they've given the group is to take these on instead of the 69th Battalion, which previously had to do all this type of work south of the Mekong. That's allowing us to collect up the efforts of the 69th. The 69th was always badly fractionated with so many different jobs. The 69th is now able to concentrate its efforts a little more and will, I think, become more effective because of it.

We fought very hard for the 35th. There was some question about whether the 35th was being gainfully employed down here. We definitely felt that they were. Now with the redeployment of the 86th, they'll end up being our only combat battalion down here, and I think that makes sense.

[Major General Harold R.] Colonel Parfitt, the 20th Engineer Brigade commander, has made the decision to leave the area of responsibility of the 34th Group just as it is until next dry season. This has to do with the missions he has elsewhere in the brigade AOR [area of responsibility].

This means that all the missions of the 86th will have to be picked up by the 93d. The major problem that has to be solved here—and it's too early to say how it'll come out—is that the 93d already had a full program with MACV advisor facilities and preparations for its work on TL24 in the coming dry season. To this has been added the

work it's doing at Tan An airfield to settle the 3d Brigade of the 9th Division, and some cleanup and disassembly work at Dong Tam. This gives it a completely full program from now through the end of the year. If there is a lot of operational support in Long An Province, then something that the 93d was already programmed to do just won't be done. That's going to be a difficult decision.

The theory is that with the 9th Division gone, the 7th ARVN Division will be operating in this area. There are ARVN engineers, and a great deal of the operational support should devolve upon them. The burden on the 93d should be less then.

The 93d won't have to pick up the full program that the 86th would have done. However, you have to recognize that the 3d Brigade of the 9th Division has been operating in Long An Province all along and certainly at least a third of the effort of the 86th Battalion was committed to them. They are still going to be there. So, if they enjoy the same level of support that they did under the 86th, this is going to be a substantial demand on the capability of the 93d.

Part III
Nancy Graves Interview⁶

Q: Did you grow up in a military family?

A: No, I did not. My father was in the paper business. However, my uncle was a Regular Army officer, so I saw the Army from their life and was familiar with it.

Q: Where did you grow up?



Nancy Graves in 1981.

A: I was born in Baltimore [Maryland]. When I was two years old, we moved to Hamilton, Ohio. When I was 12, we moved to a little town in Massachusetts.

Q: So you had a little bit of an idea about moving around yourself, didn't you?

A: I did indeed. Much more than my husband did, who was an Army brat.

Q: You know, that's a point.

A: He lived all his life here in Washington, where his father was on active duty in one place.

Q: That's right. That's exactly right. And that's unusual. I hadn't thought of that.

⁶Dr. Schubert interviewed Nancy Graves in Arlington, Virginia, in April 1985. Both he and Mrs. Graves edited the transcript.

A: In those days, moving in the civilian world was quite a big event. So the fact that we moved three times in my somewhat early childhood was different from a lot of people in the civilian world, unlike today.

Q: That's right. Where did you and your husband meet?

A: We met in Boston. After college I was working in Boston.

Q: You had already been through college?

A: Oh, yes. I had been out of college a couple of years— was working in a law firm in Boston. He was at MIT, and we had mutual friends.

Q: What kind of work were you doing at the time?

A: I was a probate accountant.

Q: I don't know what that is.

A: That's doing the accounts of the trusts and estates that are handled by a law firm.

Q: And what kind of education did you have?

A: I had a B.A. degree from Wellesley.

Q: In?

A: Economics.

Q: Economics? That wasn't all that normal for a woman at that time to go into, was it?

A: Well, it was at a woman's college, certainly.

Q: Of course. That's a good point.

A: However, economics was not the popular major that it is now. I don't pretend to be a pathfinder or anything. It just was something I liked.

Q: So you were kind of—well, you weren't really in your field.

A: No, no. But that was really—again, you have to think of the times—that was simply a job, not a profession. Young women now go more for professions than jobs. But I enjoyed it. I worked for this law firm for three years and enjoyed it very much.

Q: Was it something at the time that you thought about continuing in? Did you have any particular career goals at the time?

A: No. I wanted to go live in Boston and work. I went one day and had many interviews, and these people hired me. I fitted in very well. I liked it. I liked the firm and I liked the people.

Q: You liked Boston winters?

A: Oh, I loved Boston—winters, summers; it didn't matter.

Q: And that's where you met—when your husband was a student at MIT? He was a captain then?

A: He was a captain then and was working on his Ph.D. at MIT.

Q: And when you got married, did you get married in Boston?

A: No. My parents at that point were living in Paoli, Pennsylvania, and we were married in Paoli. But we had both been living in Boston and returned there. He was a student, and I was working there.

Q: That's right. Did you know when you got married that his next assignment was in Europe?

A: No.

Q: I was just curious about that because—

A: Initially his next assignment was to be back to Sandia Base in Albuquerque. He got that changed because he felt that he'd be going back as a very senior captain—he was promoted to major two months later—to a less responsible job than he had held three years before when he was part of the initial group of officers sent to Sandia by General Groves.

He really didn't want to go back so soon. So we went to SHAPE instead.

Q: Was your husband's father alive then?

A: Yes.

Q: What do you remember of him?

A: He was a very impressive person physically, although he was old and ill at that point. He was tall—much bigger than my husband, of course.

Q: Yes.

A: It was really quite amusing when I first met him. Ernie had told me many stories about him. I had come to Washington by train. Ernie met me at the station.

As we drove to their apartment, he spent that time telling me not to be upset if his father never spoke to me because, first, he didn't like women, second, he was old and crotchety so probably wouldn't say anything—and, besides, he was deaf. He would probably not even speak to me and I should not get upset.

So we arrived at the apartment and had lunch. And Pop couldn't stop talking to me. He was very gracious to me—asked me all kinds of questions. And, of course, I was totally tongue-tied because I hadn't expected him to say anything to me—even hello.

But he was devoted to his son, and anything Ernie was interested in, he, of course, was. So he was very charming to me, and I was really very touched by that.

I don't know what kind of an impression I made because, as I said, I was totally tongue-tied. He asked me tax problems, tax questions, and things like that, because I also did tax returns for this law firm. I just could not get my wits together because I hadn't expected him to speak to me.

He was rather awesome.

Q: I imagine he was. And there are clues of that all around, including that photostat of that letter that's in your dining room.

A: That Ernie wrote to his father?

Q: I think, yes. Or that he wrote to his mother about his father.

A: Yes, that's right. Pop was just a very fair square-shooter, and he had very high standards.

Q: I imagine that he did. You had your first separation briefly when your husband went to SHAPE, didn't you?

A: Yes, that's right. We were married in May and went back up to Boston.

Q: That's 1951.

A: We went back for Ernie to finish his thesis. He had originally planned to have it finished, and then we would be married. However, he came down with mononucleosis and was in the hospital for eight weeks. So then he had to stay another semester at MIT.

We were married in May, and he finished his thesis that summer. We stayed in Boston, and I typed the thesis. That was the first big strain on our marriage because we had an old-fashioned typewriter which didn't have the keys for formulae. I can remember that I did not always leave enough space for him to handwrite the formulae.

One particular time, the fact that I hadn't left the space meant I had to redo several pages. And I thought he could jolly well write smaller and get it in. And he allowed as how he couldn't. It was probably a good thing that I was a bride at that point, but I retyped those pages. He finished in September and went to SHAPE.

I couldn't follow until he had housing. He found that all that really meant was that you could have a hotel room. Although from stateside, they told you that you had to have housing.

Then it took two months to get my orders, to get my passport, to get all of these things when I was very new in learning the system. I finally went over the last day of November.

Q: But that must have been very exciting.

A: It was great.

Q: That was your first experience in Europe?

A: Yes, that's right.

Q: And your first experience with the separation which the military imposes, although a small one?

A: Yes. That was a couple of months.

Q: I focused my question on that because I wanted to get into this matter of the—you know, the phrase “Army wife” in general. That’s more than a cliché, isn’t it, because you really are—

A: Oh, it’s a profession. It really is a full-time job. And many people are not suited for it, but I think I was particularly suited for it.

Q: Would you talk about it in general, you know? How is it a full-time job? What does it require?

A: Well, it requires a willingness to change. Every situation was different, I feel, through the years. Every assignment Ernie had, I had a different role. I think it was quite a challenge to do it well.

Q: I’m sure it was.

A: And I think it’s very important that the wives admit that this is a job.

I think the assignments and the career of the husband come first, but I don’t feel the wife should feel that she’s second place. It’s just that these decisions are made way out somewhere. You don’t just decide, “Well, I want to go here or there.” The government decides or the Army decides or your husband decides or something, and you go and you make the best of it. There’s something good in every place.

Q: The career essentially belongs to both of you.

A: It does indeed, except, as I say, the wife does not have much impact on where the next assignment is—I don’t feel she should. I feel that, yes, she should be considered to some extent. But it’s primarily what’s good for many features other than simply her personally.

Q: One of the things that I was struck with when I talked with your husband about this, about how assignments are determined—he was, you know, very unabashed about how he went to his father’s friends when he needed help.

A: Very infrequently. The one time I mentioned is the only time I remember. Rather than going to Albuquerque, he really thought going to SHAPE would be very exciting. And there were very few junior officers there.

The aides were about the only other ones that I can remember who were as junior as he was. He did have one classmate over there who was an exec to somebody. But generally, we were with older people. Lieutenant colonels and colonels were doing the

staff jobs at that time that might in time have devolved to more junior officers. But then they were the ones.

Q: So it must have been an assignment with great prestige then?

A: Yes. To get over there early to SHAPE that way. The first people went to SHAPE in about January of '51, and Ernie went in September. So he wasn't in the very first vanguard, but he was very early on.

Q: How difficult was it to come to terms with this role of Army wife? Were there a lot of surprises in there for you?

A: Well, no. Not really. I had never been a wife before so there were lots of surprises in that, too, I guess. I think an Army wife has to be very self-sufficient and not dependent on her husband for her own interests.

I was dumped in Paris. I couldn't speak French. We did have one very close friend—well, who became a very close friend. I had never met her before. She was General Somervell's daughter [Susan]. General Brehon Somervell and my father-in-law had been very close friends, and Ernie had known his three daughters from childhood.

She was living in Paris with her husband, who worked for General Motors France. She was a tremendous help to me. She got me a French teacher. She got me an obstetrician. She got me all kinds of help that put me very much at ease and made those first six months in Paris much easier.

I think one could have gotten very depressed and felt overwhelmed. The other Americans at SHAPE weren't my contemporaries, and we weren't living near any of them. We were living in a hotel. Later we got a little house in Saint Cloud.

So a service wife—it isn't just Army—really must be self-sufficient and enjoy being self-sufficient and enjoy meeting the challenges of being alone in a foreign environment.

Q: And the French aren't exactly warm and charming, are they?

A: Well, no, especially the fact that I couldn't talk to them at first. We had very little intercourse, really, with our neighbors. They were friendly, but the yards have walls. You know, you aren't on an open lawn like this. And I was very busy. When I went over to France, I was in the early stages of pregnancy. Our son was born six months after I got over there. So I was quite involved with being a new mother.

Q: You were very busy?



John W. and Susan (Somervell) Griswold with Major and Mrs. Graves at the christening of Ralph Henry Graves in the American Cathedral in Paris, August 1952.

A: I was busy. And I didn't feel all that well at first, although that was very brief. But it was a challenge—to learn French and see Paris. You know, I looked at all those little children who were speaking French. And I thought, well, if they can speak French, I can speak French. So it was, yes, a challenge. In all of our different tours, there was a different challenge in every one of them. This one was to speak French and get along in Paris.

Q: How long did you stay over there?

A: Three years.

Q: Wow. So your first child is a son, right?

A: Yes.

Q: He came home speaking French?

A: No. He was only two when he came home. He wasn't speaking anything. He was just beginning to talk. We think one reason he was so slow to talk was that he heard both languages.

Q: Military families appear quick to form support groups.

A: This is very true. But just our environment there in Paris—there wasn't any. That's all.

Q: That's right. But other places, that does obtain, that these people do—

A: Oh, absolutely. But most of the time, we lived places that we were not in an Army group.

Q: That's right. I hadn't thought of that. You really were left on your own resources.

A: I was left on my own resources. Everyone needs a support group. And everywhere we moved, I joined a Wellesley group. There is a Wellesley alumnae association in every city in the world, I think. I met some people through that in Paris. As a matter of fact, one of the women who did become a close friend of mine lived nearby and was also a Wellesley graduate. Her husband was with an oil company. We discovered each other out pushing baby carriages.

So, yes. There were different support groups. Actually, I would say that in those early days, I don't think the Army, although it was supportive, had the emphasis on family that it has now.

You know, this was 30-some years ago. The world was quite different. Everyone was very friendly, and especially [Major General] C. Rodney Smith, for whom Ernie was working, and his family. They were all very supportive of us.

But I really didn't seek support or help. I had my friends. We were a little more oriented towards Susan Somervell's friends in the civilian world than we were the military. We had military friends, of course, especially the Canadians, but socially we were more in the civilian world.

Q: Did you get much of an opportunity to travel during that tour? I know you had a youngster.

A: I had two babies in those three years. So no, I did not travel much. We did make some trips. We went to Garmisch for a week, and that included going through Switzerland

and Germany. That was when Ralph was about six months old and we were able to leave him with my friend who lived across the street.

Then we made a trip to Holland. We had a Dutch girl living with us. We took her and Ralph to Holland because she had to make periodic trips back to renew her student visa. We also spent two weeks in England and Scotland.

And then we spent the last month in the south of France because we were not allowed on the airplane with a newborn baby. The baby had to be 10 weeks old. We moved out of our house and went to Guethary in the south of France with the brand new baby, a two-year old, and a Dutch girl.

Q: So you went over there with no children and you came home with two?

A: Came home with two.

Q: That's quite an accomplishment for one tour.

You know, you said something that once you mentioned it, became obvious, but I really hadn't thought about it. You really didn't have a regular military career because you didn't live on military posts.

A: That's right.

Q: I guess Fort Belvoir is the only post your husband was stationed on in the states.

A: Well, the schools—Leavenworth and Carlisle—and in 1971 to 1974 we lived at Fort Sheridan, Illinois.

Q: Right, sure.

A: But no. That's true. At SHAPE, they later built SHAPE village. That was really an Army post, except it was multinational. They had a point system to be eligible—number of children, time in country, et cetera. We didn't qualify and didn't want to live there anyhow. We wanted to live on the economy, in the French environment. But that would have been a post environment, if you will.

Q: So your whole experience is really different from what you might call the normal Army family because you were an Army family in a civil environment most of the time?

A: Yes. I think this applies to the engineers a lot—not necessarily us, in particular. You go out to district jobs. You go out to the various jobs, and there's not a large Army community. And generally, you do not live on a post.

Q: That's right. But when you came back from France, you did come back to Fort Belvoir.

A: We went to Belvoir. Ernie was a student, and then we stayed two more years when he worked in the nuclear power program.

Q: What did you think about that environment? Did you enjoy living in that environment?

A: Oh, very much. Oh, yes.

Q: Did you have quarters on the post?

A: Yes.

Q: Were you beginning then to think about—I remember Barbara Tuchman's biography of [General Joseph] Joe Stilwell—how early in his career, he saw Monterey, California, and he decided this was the place where he was going to live. But, of course, he did not live very long after he retired. But that's where he wanted to go early on. Were you thinking about where you were wanting to live at that point?

A: No. I really and truly don't remember that we ever discussed where we would live, because we both were sure we'd live in Washington. We simply never discussed it. It just happened.

Q: Where did you live when your husband went to Korea? Was it 1958?

A: Yes.

Q: That was his first unaccompanied tour after you were married.

A: Yes, that's right. And I came back to this area. My parents, by this time, had moved to Cleveland, Ohio. I had no interest in living in Cleveland, and they had each other. My mother-in-law, of course, was widowed. I felt that I should be near her.

We tried to find a house for me and the children in Annapolis. We had one, but the lady backed out at the last moment. So we decided that I would come here to be near Ernie's mother and because there were so many West Point classmates.

That was a time that I felt I really did look for a support group, if you call it that. There were so many friends here. I play golf, and we belonged to the Army–Navy Country Club. So I wanted to have that opportunity to play golf. That’s another whole circle of friends who are military, but are not our friends through the military. They’re our friends through golf.

Q: How many kids were there by 1958?

A: Three.

Q: And they must have been a full-time job?

A: Yes. They were. They were a challenge. When Ernie went, they were two, four, and six years old.

Q: So they were starting school.

A: Ralph was starting school. I don’t know how many of our little family stories you want in this. But Ralph entered first grade just after Ernie went to Korea. I decided I needed a vacation. My mother came to take care of Ralph and Willy, who was two. And I took Robby, who was four, with me and went to New England to visit friends.

While I was gone, my mother got a message from the school that they had given Ralph a test and they were very disturbed by it, because he had totally flunked the reading readiness test. They thought he was a bright child and they couldn’t understand. Well, it seems that the test was not appropriate to the child because he had been reading for two years at that point. And to give him a reading readiness test when he was already reading just didn’t work. That was just one of the things that happened.

Q: But, you know, life is filled with these little crises—and they are at the time, aren’t they, because you don’t know what the—

A: I really wasn’t upset. I knew the child could read, which they didn’t know—couldn’t figure out.

We spent one year there. It was a good year. It went very fast. We kept very busy. I always made an effort to be upbeat about all of these things. Before Ernie left—and he took about two months leave, I think, before he left—I heard my son Ralph, again, out in the neighborhood where somebody had asked when his father was going to leave, saying, “We don’t know, but we certainly wish he’d hurry and go because we are going to have so much fun after he is gone.”

So that was the way I felt the Army wife has quite a responsibility, because if she lets herself get down, then it spins off on the children and it snowballs and it's very bad. But the boys and I had a good time.

Q: Does it get progressively harder to get upbeat about these things? Or does it get progressively easier? Or does it matter?

A: I wouldn't say. I never had a problem with these things. I knew from the beginning there would be many separations. I certainly knew Ernie should go and must go to Korea, that he must go to Vietnam. And no, I never even thought about it. I guess I was peculiar. But all these problems that are now coming up about wives and families never occurred to me. You must remember that my point of reference among the military had been more to separations of two or three years during World War II than just one year.

That was his career pattern. I was prepared for it long before we were married. The letter he wrote to my father asking to marry me said, "There will be times when Nancy cannot join me." So, you know, it never occurred me to make a problem about these things. It was my idea that I should make the best of it for him so that he wouldn't be worried about the family. I think he always had confidence in my being able to cope with the children, which I did.

Q: Judging from what you just told me about Ralph's comment to his friends, your kids were pretty well equipped to deal with it, too.

A: I think so. But I made a conscious effort to develop them that way.

Q: What kind of a father was your husband?

A: Oh, I think he's a great father. He was not the father that went to the ball games and watched from the sidelines. But he taught them all to read—all four of them—took the time to teach them to read.

He was always wanting them to think about what was going to happen next. He's a very far-sighted type. I mean, through all of this construction and remodeling of our house, this has been one of the things he has emphasized. He can see what would happen next if such-and-such was done this way. So that is the guidance he has always given the children—not to belabor, "what do you want to be when you grow up," but to think about it and to plan as you went along so that you had options when you got there.

Q: Of course, he was an only child.

A: So am I.

Q: And his father was very, very closely observant of his progress.

A: That's right. And I think Ernie had the same attitude towards his children. Ernie was younger. Ernie's father was 44 years old when Ernie was born, and that in itself makes an entirely different relationship, you know. By the time Ernie was 10, 12 years old, his father was well in his 50s. That's a wholly different relationship. Ernie was a generation younger when his children were born.

But he was always busy. He had very time-consuming jobs. I went to all the baseball games and football games and diving meets. I don't think he ever went. I think the children would have liked him to go, but they accepted this relationship. So long as somebody was there, we were supporting them in what they did.

But it was a full-time job for me. I don't see how women can work and raise a family and be an Army wife. Something has to give. I was fully employed, I can assure you, through all these years.

Q: You only lived on the military post that one time?

A: Other than Leavenworth and Carlisle. And then Fort Sheridan, but that's much later in life.

Q: Is there an informal chain of command among Army families? Do wives of senior officers—

A: Oh, I think there's a certain respect for the wife of a more senior officer. But I think that would be true, or should be true, in the civilian world as well.

Whenever my husband had a troop command, I was elsewhere. I wasn't part of that. I think in the other branches of the service, probably the wives are more conscious of this chain-of-command concept. I am not because it was just never in my experience.

In various jobs that Ernie has had, of course, he always had a boss. Even when he was a three-star general, he had a boss. I think there were times, probably, when the wife asked me to do something—but never in a commanding way. I was always very happy to be a part of it. No, I don't really think about that.

There's no rank among wives, they say, you know.

Q: They say that, do they?

A: They say that.

Q: I didn't know.

A: Oh, that's an old cliché.

Q: Is it true?

A: Probably not.

Q: Overall, what is the stamp of this kind of a career choice on child rearing? What are its benefits and the problems that it caused?

A: I think the benefits are the different experiences. I think that, generally speaking, the military children have benefited from moving around, from being able to cope with situations, with not being tied down to a very narrow environment.

I feel that I have seen this in many children—service children—that they are brought up to be independent. Now maybe this is because of their mother—the successful Army family has a very independent woman in it. And this can't help but be an influence on the children.

Q: Especially since you're the parent they see the most.

A: You're the parent they see the most. You are making them be independent. Part of raising them is to make them be independent.

Q: That's your job. That's right.

A: I would imagine this might be true among civilian wives also. But it isn't as necessary.

I think there were more benefits in moving than shortcomings. I think we were rather fortunate in that I do think one of the problems in raising children in the military is the high school years. We were fortunate that affected only one of our children.

When he was a sophomore, we left him to board in school, and I feel we should have had him with us. Later he did come to be with us. And so we overcame that problem.

But I can see where moving around in high school is a severe problem on the children. That, I would say, is the biggest. Through the early years, I think it's more of a benefit—the move to different schools. Ralph was in nine different schools the first nine years of his school life.

Q: Is that right?

A: And heaven knows, it didn't hurt him. But we did a lot at home on schooling. Not only did Ernie teach them all to read, we read with them. We worked on their schoolwork with them. We supplemented the schools, which they're now saying—I read articles in the newspaper—is what they want parents to do. At that point, they did not want parents to do that.

We often found that teachers thought we were meddling and we shouldn't be doing these things. But we had to overcome the fact that maybe next year the kid wouldn't be in that school, he'd be in an entirely different school. So he had to be able to cope.

Q: Did your husband consciously set out to teach all four of his children to read? Is that something he wanted to do?

A: He consciously set out to teach Ralph to read. Having taught him, he felt he owed it to the others. So, yes. He read a book on a plane one time—you may have heard of the book, *Why Johnny Can't Read*.

Q: Sure.

A: He picked it up in the airport, and he read it. In the bibliography was recommended *Reading With Phonics*, which is written by two men named Hay and Wingo. He immediately bought this book.

At that point, he was working all hours of the day and night for General Lampert in the nuclear power program and didn't see Ralph, who was almost four years old, very much. But this was the time they had together—about an hour after supper that he sat down with his Hay-Wingo book and taught Ralph to read with it. That was their time together. Ralph was quite able to learn.

I think almost any child can be taught to read at a very early age. And I think that the educators are finding that now. At this time, they would tell us we were making disciplinary problems because when the child entered school, he already could read so, therefore, he would be bored. We felt it was up to the teachers to keep him interested in something.

Q: I'm with you.

A: We had different problems, different teachers. But now they want the parents to help.

Q: Which of your husband's assignments was the most difficult and stressful for you?

A: Why don't you ask me which was the most exciting? I didn't find stress due to my husband's assignments. I don't wish to make myself out to be a Pollyanna. I really don't. But I have thoroughly enjoyed this life.

Q: That's great.

A: I readily admit many women couldn't be Army wives. That's perfectly true. I probably couldn't be an astronaut's wife. I don't know. You're in different situations.

But if you want me to say that I had such a stressful time when my husband was in Vietnam, I didn't. I really didn't. I didn't let myself have it. I didn't worry about him. I knew he was out doing his job, and I was here doing my job. There was no assignment of his which was stressful on me.

Q: Okay. Which was the most exciting assignment?

A: I really can't single one out because I feel they were all different. I think, probably, the last assignment when he was dealing in international security affairs. That opened many new avenues of interest. We met fascinating people and world-known leaders. That, I think, was very exciting. We did a lot of entertaining, so I was a part of it. We went to many events at embassies and attachés' homes, and that was really very exciting. At that point, I had no children at home, so I could devote time to entertaining, and I was free to travel with Ernie.

Q: Obviously I'm bringing some erroneous assumptions to my questions.

A: Well, I don't know about that. I just want to knock some of them down—some of your preconceived ideas.

Q: Well, that's the idea. If they need knocking down, then you have to do it because that's the purpose of the whole thing.

But in some ways, I am a little bit surprised, because of my assumptions. I look at women I know—many of whom have careers—and they seem to think it's very important that they have to have—it's just important for them to have this kind of work, rather than the kind of work that you did so well.

A: I honestly feel that there is no more challenging job than raising four children—or raising children. One child, I think, might be harder than raising four of them.

Q: One's a handful.

A: One's a handful, and one's a challenge because he doesn't have siblings to interact with, and you have to make that environment for him, either with friends or with your relationship with him or something. I know about being an only child.

But I think there are probably more failures in the endeavor of child raising than any other endeavor in the whole world. To be successful, I think, is a full-time job.

You know, there were other things that took my time. I didn't sit home and simply take care of children. I feel that the mothers or wives must have interests of their own—outside interests—to make an interesting person. I played golf; I belonged to a neighborhood book club; I did volunteer work with Scouts and school because of the children.

You can't just go into hibernation and be a mother and a housewife. I don't feel that that helps anybody. I also had another responsibility. For about two years my mother-in-law was very ill. She broke her hip and made a fine recovery for the first year, and then it was downhill after that.

Every day for two years, I drove from here to either Distaff Hall or Walter Reed to oversee her household and to see her. So there were many claims on my time. But I always tried to have outside interests. I have many outside interests—sometimes too many, my husband would say.

I often think, what would my life have been had I married somebody else, or had I been in a different environment. I really don't think I would have grown the way I have or enjoyed life so much. A lot of that is due to Ernie. He set many challenges for me, you know, that he wanted me to do—to learn to do.

Learning to use the computer is just one example of it. But all through our lives, there have been challenges to meet, and each new assignment was a new learning experience.

Q: Are you inclined to be as methodical as he is?

A: Oh, no!

Q: I mean, he obviously plans way, way ahead.

A: We complement each other on these things.

Q: What about particular challenges of raising a family in the late 1960s and 1970?

A: Oh, I think our children were very much creatures of their times. Our oldest boy graduated from high school in 1970.

His rebellion, if you will, was to go to West Point. Now that may sound a little strange. But he went to Saint Albans School, which has its own standards. They were very much East Coast liberals. He got absolutely no support at all from anybody—either his peers or the faculty or the headmaster—except for Mr. Saltzman who is [Major] General [Charles E.] Saltzman's son—to go to West Point.

They felt it was a waste of his intelligence. He was valedictorian of his class, and, of course, they thought he should go to Yale or Harvard or that kind of school.

You have to go back in time. That was the Cambodian incursion, and the schools were closing. In the spring of 1970 when he had to make his decision, he really didn't know—nor did anyone—if Harvard or Yale would be open in September. They were closing, some of them, early that spring.

Q: I remember.

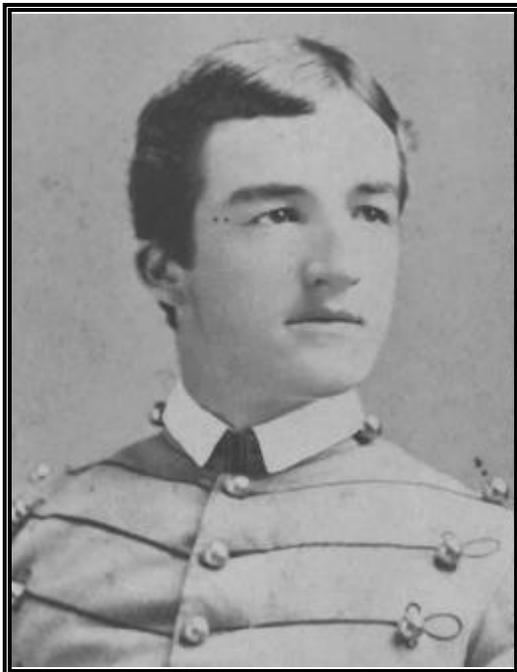
A: And he said, "I'm going to college to get an education, not to march in parades." Well, I shouldn't use that because he did end up marching in parades. But not to march as a protestor. So that was one of the reasons—I think one of the very major reasons—he went to West Point. Had it been another year, I think he might not have gone.

Our second son is very straight, conservative, and was very busy in school with studies, athletics, and extracurricular activities. He didn't have any problems.

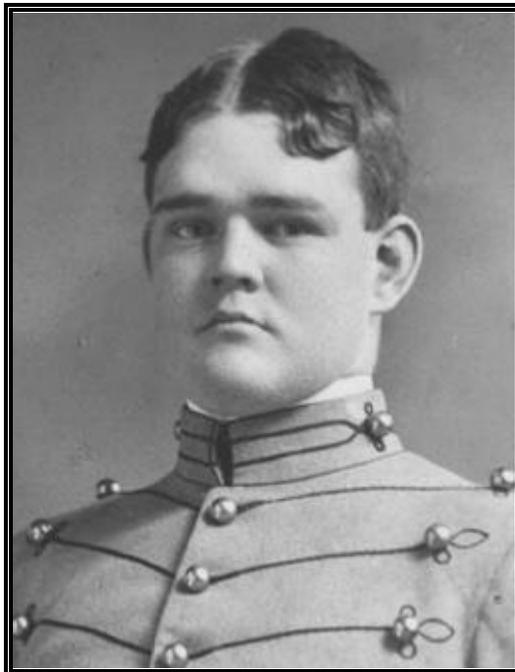
Our third son continued at Saint Albans School in Washington after we moved to Chicago in 1971. In his second year as a boarder, after some other infractions, he was suspended for skipping evening study hall and violating curfew on a school night. So we got him back in the home fold and faced his his behavior straight up and straightened him out—not without some heartache, but we did. He was intelligent, and we got him to realize the consequences of his folly.

That's why I think the high school years are so important. We were just lucky not to move much at that time. When Emily was in high school, we were set in one place for four years. I think that our third son grew out of his rebellion in a short time and got his feet back on the ground. He has gone on to be a responsible adult.

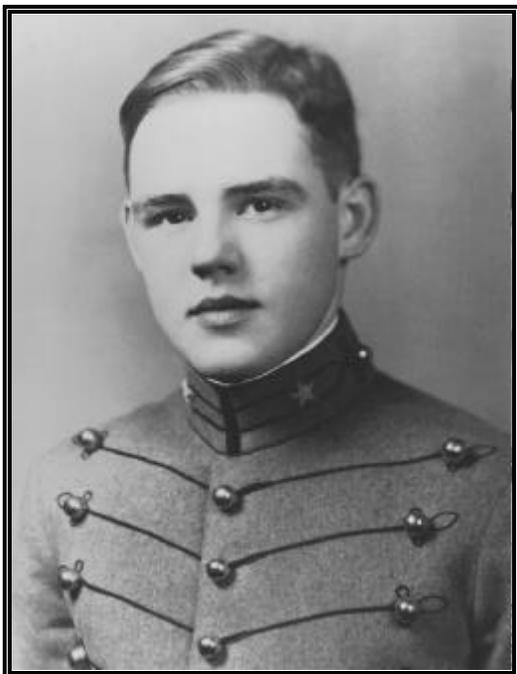
Q: I am really fascinated by your oldest son's choice. Were you surprised by his decision to go to West Point? Had you encouraged him to do that?



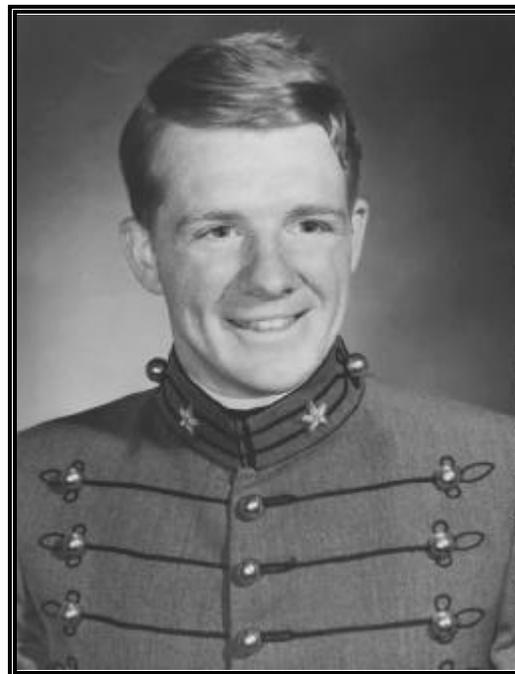
Rogers Birnie, Class of 1872, No. 1



Ernest Graves, Class of 1905, No. 2



Ernest Graves, Jr., Class of 1944, No. 2



Ralph Graves, Class of 1974, No. 1

Four Generations of West Point Graduates

A: We had encouraged him to keep the option. To go to West Point, you have to start thinking about it long before you have to think about going to a civilian college because you have to get your appointment and you have to do all these things—the physicals and all of that. So we did suggest to him that he get this option.

Ernie came home from Vietnam in the summer of '69, just before Ralph's senior year, which is the time you take your children on the tour of colleges. He and Ernie drove to look at New England colleges. We are New England-oriented. Ralph was to pick out which ones he wanted to see, but Ernie did inject, "Well, let's just stop at West Point. You should see it, and my good friend, Freddie Smith is up there, and we ought to just talk to him."

So they did. But that was just keeping the option for him. When Ralph got all his acceptances, he had many fine options. He's methodical. He thought about the pros and cons of all of these schools—which, again, was colored by the upheaval on the campuses at the time he was having to make this decision.

He went upstairs in his bedroom one night. I guess he was up there about three or four hours. And he came down and said he was going to go to West Point. I was thrilled. I felt it was good for him.

The full-man concept that the academies have was great for him. It really was. And I think he has not regretted it.

Q: Your husband must have been very proud to have him there?

A: We are. And of the fact that he graduated number one. We knew he could do it and just were afraid he'd fritter it away. But he didn't. He hung in there.

Q: You weren't particularly interested, or you didn't particularly try to channel your kids towards a military career—any of them?

A: No.

Q: I guess not one way or the other.

A: No. We felt it was a very good option. Ernie has had a fine career. He has had many opportunities, many interesting jobs. His father before him found that the Army was interesting and at times very exciting. We thought it was fine.

I would have been very happy if the other boys had gone in. Their personalities were different, and they weren't particularly interested. We certainly never pushed them. They didn't even apply to West Point.

Q: You have a daughter in the military, too, don't you?

A: Yes. But not a West Pointer. Many times she was asked by acquaintances if she would go to West Point. But she was raised by parents who feel women do not belong there.

Q: Oh, is that right?

A: I feel that way. If you think we pushed the children towards the military, we certainly pushed her away from being among the first women at West Point.

Q: Why do you feel that way?

A: I feel it should be combat training for officers to run our military, and I'm very old-fashioned about the role of women. They don't need to go to West Point.

A very small percentage of officers are academy graduates. I think there are many, many places for the females in the military, but I don't think they have to be educated at the academies. I think this has changed the academies, and I just don't think women belong there.

They can go ROTC [Reserve Officers Training Corps]. Our daughter went through OCS [Officer Candidate School]. We're very proud of what our daughter is doing, and the fact that she went through basic training at Fort Dix. She's a non-athlete, and she managed to do all the physical requirements and went to OCS—

Q: Is very rigorous.

A: Both her father and her brother feel OCS is one of the hardest ways to get a commission.

Q: Yes, it is.

A: And she did that. She's an AG [Adjutant General Corps] officer. We're very pleased. I have two daughters-in-law who are military. An Army nurse is one of my daughters-in-law, and my newest daughter-in-law is Carole Smith, [Brigadier] General [Frederick A.] Smith's daughter—Freddie Smith's daughter. She is an ordnance officer.

So I feel there is a role for women in the military, very definitely. But I don't think it's at the academies. But I shan't belabor that any more.

Q: It's an important point. What advice would you give to young families setting out on a military career?

A: Do you mean setting out on a military career with one of them or two of them?

Q: Well, either way.

A: Well, maybe it's the same either way.

I feel definitely that the man's career should be first. I do not think that in any situation you can have two determining factors. There has to be one. Something's got to give.

I never felt I was second class by being an Army wife who deferred to her husband's career. That was part of it. But I always felt that his career and his assignments were the driving force.

I think that's true in civilian life. You can't have two careers where neither is taking precedence over the other. I just don't see how it can ever work—and especially in this more mobile world we have today in the civilian world. Moving there is now certainly equal to what the military do—numbers of moves.

Q: You're not kidding.

A: And always there's got to be one that has to be dominant. I also don't think you can shift back and forth. I don't think one can say, "This time we're going to make the best move for your career, but the next time we're going to make the best move for my career." I just don't see how logically this can ever work. I'd be very willing to be proven wrong, and I'm sure in some cases, it is made to work. But I don't think it's the optimum.

I feel this is also true in the two-military-careers family. My family knows how I feel about this. My daughters-in-law know how I feel about this. I feel that the man's career should be the determining factor because I feel that, really and truly, what life is all about is family and having children, and I think only women can have children.

Somehow, I have been raised to feel that only the woman can have a child. Therefore, that is her primary role. And her career is second to that. Now if people choose not to have children, that's their choice, but I feel they are missing life's purpose.

Life isn't black and white. There are many grey areas, and I don't wish to sound as dogmatic as many of my friends and family think I am.

But there always has to be a goal. There has to be a driving force. I don't think a family unit can have two driving forces. I don't know if I've been very articulate about that or not. But that's the way I feel.

Q: I've never done an interview with the spouse of an officer before. I've done 80 or a hundred with soldiers—both active and retired. So, I'm not sure I'm doing a good job of this.

And I only have one question left, and it's really—you've obviously been thinking about our conversation beforehand. What questions should I have asked you? What do you want to talk about? What's important that I've missed?

A: Oh, I think that you have certainly hit the important thing, which was my reaction to Ernie's career, both as a mother to our children and as his wife. That, I felt, was the most important thing.

I can certainly sum it up that I have found all of the moves a challenge, a learning experience—there was something different I had to learn in all of them.

The first one, I had to learn French. The second one, I had to learn to be a wife and a mother. I came home with two children. I had had household help the three years we lived in France—had a live-in Dutch girl. Suddenly, there I was confronted with being a housewife with two little children. That took some learning!

When Ernie was in Korea, I had to learn to be on my own. The next year, we went out to California. Then we learned how to plant grass and take care of lawns and pour concrete and do a few things like that. That was fun. We enjoyed that—those five years out there.

Q: That was kind of an academic environment out there, wasn't it?

A: Well, not really a structured academic environment, no. There were probably more Ph.D.s per capita than any place in the world, including college campuses. But it wasn't the academic environment as such. It meant the schools were very good because most of the children's fathers had advanced degree and were scientists.

All of this includes learning to move and learning to have the children be very self-sufficient. And they were very lucky. I admit we had a lot of luck. The three boys, as

we moved into new environments, didn't care whether there were children around to play with or not because they played with each other. So this made it easier.

Q: Your husband retired about four years ago.

A: It will be four years in July.

Q: What kind of adjustment has that involved for both of you?

A: Well, I feel the fact that we did not move when he retired, which we had planned—you talk about planning ahead—made it a much easier adjustment. This was definitely thought of ahead of time when he received his third star. We could have had quarters at Fort McNair. We were already in this house. We had already decided this was where we were going to stay when he retired. We knew that assignment would be his last assignment. So we consciously did not take quarters at McNair. One of the major factors was that we didn't want to have to move at the time of retirement. We wanted to be able to be right here, and that he could choose—easily have whatever option he wanted as his work after the Army. So there was very little adjustment, really.

Q: Did your husband ever have second thoughts about his military career?

A: Never.

Q: Did he ever think about getting out?

A: Never.

Q: One of the things that kind of surprised me when I talked to him—and very little did surprise me, but—because he was a pretty methodical and systematic—

A: Oh, yes.

Q: Not pretty methodical. Extremely methodical and systematic person. I was surprised that he seemed to derive the most satisfaction from being Director of Civil Works and not from getting his third star and going to DSAA—that civil works was his first love.

A: I believe this is true. I think this is from his background—he's always said that—from his background as a little boy when his father and all of his father's associates were in civil works. To them, civil works was the plum assignment, at whatever level.

I remember he'd tell stories of General Larkin, who built the big earth-fill dam in Montana.

Q: Fort Peck?

A: Fort Peck. Ernie, as a little boy, would sit there with his eyes and ears wide open when [Lieutenant] General [Thomas B.] Larkin came to dinner when he would be in Washington from the site out there and tell his father—Ernie's father—about building the dam and the problems and the excitement and all. And this is just what Ernie was bought up on.

So, one, to have civil works jobs as you go along was exciting. But to be Director of Civil Works—all his life he had seen this as the most exciting job. And it turned out to be a very exciting job at the time he had it, but I think his only regret is that he didn't have it longer. It was a very short time.

Q: But DSAA wasn't an anticlimax because it was—

A: Oh, no, no. That was totally different. That's apples and oranges. It was an absolutely different environment. You see, an awful lot of people who are in international security affairs have come through the attaché jobs.

Q: That's right.

A: We had never had that experience. So, yes, it was totally different. But again, it was a big management job. There was a great deal of money involved—keeping track of it all.

It was very exciting. It really was. But the civil works, that was fun. That was good.

Q: Is there anything else we should talk about?

A: I don't know. I think you've gotten a feel for the way I feel about the Army. I guess that was what you wanted.

Q: I sure did. And I thank you.

A: Well, I thank you. I'm very pleased to have been of any help.

Acronyms

ABM	Antiballistic Missile
AEC	Atomic Energy Commission
AEF	American Expeditionary Force
AFRCE	Air Force Regional Civil Engineer
AG	Adjutant General Corps
ALCO	American Locomotive Company
AOR	Area of Responsibility
APPR	Army Package Power Reactor
ARVN	Army of the Republic of Vietnam
ASACW	Assistant Secretary of the Army (Civil Works)
ASCOM	Army Service Command
AWACS	Airborne Warning and Control System
BDM	Braddock, Dunn and MacDonald
CBS	Columbia Broadcasting System
CEBMCO	Corps of Engineers Ballistic Missile Construction Office
COMZ	Communications Zone
CONOPS	Construction Operations Division
DEW	Distant Early Warning
DMA	Division of Military Application
DMZ	Demilitarized Zone
DNA	Defense Nuclear Agency
DSAA	Defense Security Assistance Agency
EAB	Environmental Advisory Board
EACC	Emergency Action Coordinating Committee
ENCOM	Engineer Construction Command
EPA	Environmental Protection Agency
ERDA	Energy Research and Development Administration
ERTC	Engineer Replacement Training Center
FEMA	Federal Emergency Management Agency
GSA	General Services Administration
G-4	Deputy Chief of Staff, Logistics
ICBM	Intercontinental Ballistic Missile
IG	Inspector General
IJC	International Joint Commission
ISA	Office of the Assistant Secretary of Defense for International Security Affairs
JCS	Joint Chiefs of Staff

KATUSA	Korean Augmentation to the U.S. Army
KSC	Korean Service Corps
LMVD	Lower Mississippi Valley Division
LOC	Lines of Communication
LST	Landing Ship, Tank
MACV	Military Assistance Command, Vietnam
MCA	Military Construction, Army
MIT	Massachusetts Institute of Technology
MP	Military Police
NAD	North Atlantic Division
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organization
NCD	North Central Division
NCO	Noncommissioned Officer
NEPA	National Environmental Policy Act
NEPO	Near East Project Office
NOAA	National Oceanic and Atmospheric Administration
NSAM	National Security Action Memorandum
NSC	National Security Council
OCE	Office of the Chief of Engineers
OCS	Officer Candidate School
OMB	Office of Management and Budget
OPO	Office of Personnel Operations
OSD	Office of the Secretary of Defense
R&D	Research and Development
R&R	Rest and Recuperation
RMK	Raymond International and Morrison–Knudsen
ROTC	Reserve Officers Training Corps
S&A	Supervision and Administration
SALT	Strategic Arms Limitation Talks
SAM–D	Surface-to-Air Missile Development
SDI	Strategic Defense Initiative
SHAPE	Supreme Headquarters Allied Powers, Europe
SM–1	Stationary, Medium Power
SOP	Standard Operating Procedure
S–3	Operations and Training Officer
TACOS	Tactical Air Combat Operations Simulation
TAMS	Tippetts–Abbett–McCarthy–Stratton
TO&E	Table of Organization and Equipment
TOC	Tactical Operations Center

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